TECHNOLOGY DEPT.

January 19, 1942

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JA 12

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE
ESTABLISHED 1882

Fairbanks Dial Scale head with Printomatic Weigher. Press a button and the weight is printed on a ticket, roll tape, or ticket and tape . . . even on sheets 18 inches wide!

Speed WITHOUT ERROR!

Speed production with modern Fairbanks Scales. They weigh *faster!* They weigh *automatically, without human error!* They even weigh materials *on the move . . . print* records and receipts . . . *count* small parts and products.

Investigate the advantages of today's Fairbanks Scales. Our engineers are at your service. Write Fairbanks, Morse & Co., Dept. A-75, 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.

FAIRBANKS·MORSE SCALES

DIESEL ENGINES ELECTRICAL MACHINERY MAGNETOS RAILROAD EQUIPMENT WASHERS-IRONERS
STOKERS PUMPS MOTORS WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS

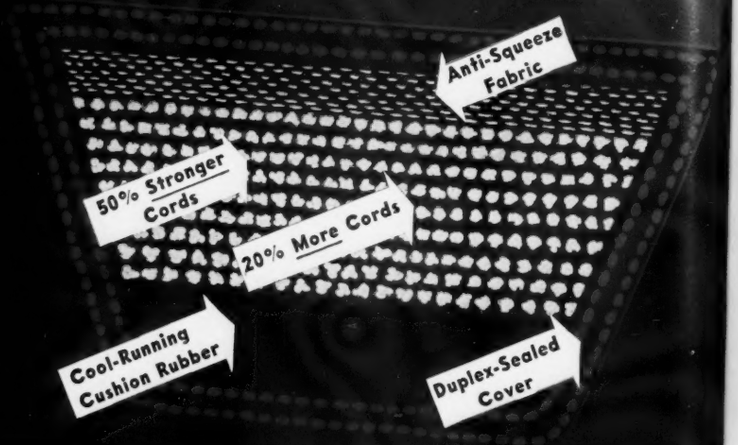
50% MORE CORD STRENGTH
IN NEW TEXROPE SUPER-7!

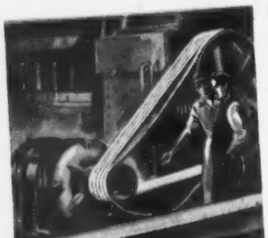
1 50% STRONGER CORDS! Sensational new Flexon process makes cords 50% stronger than even those in former great Texrope belts.

2 20% MORE CORDS! Count them! You get 20% more of these tough, extra pulling power cords in every Texrope Super-7.

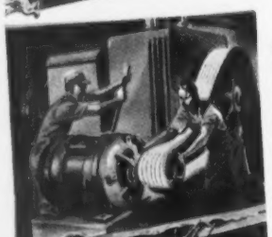
3 INCREASED LIFE! Cords float on amazing cool-running cushion rubber that absorbs shock . . . actually increases belt life phenomenally.

4 EXTRA PROTECTION! Exclusive duplex-sealed cover protects pulling cords against dirt, grit, moisture, and other adverse elements.

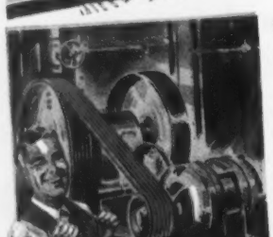




LOOK OUT FOR DANGER in belts with stiff, unpliable cords! Such belts *look* strong... but actually they buckle over sheaves, build up excessive heat that attacks pulling cords. Result: Belt failure far sooner than you expect it.



WARNING SIGN! Sagging, slipping belts mean too much stretch not backed up by balanced cord strength. Motor must be pulled back often to take up slack. Result: When stretch limit is reached belt breaks under tension.



SUPER-7 TEXROPE BELTS are made by amazing Flexon process that *combines* flexibility with low stretch... great strength. Cords float on cool-running, shock absorbing cushion rubber. Result: *true* strength ... *true* pulling power ... *true* endurance.

GREATER strength . . . more flexibility . . . increased resistance to stretch . . . plus longer life — these are new operating features built into the NEW Texrope Super-7 V-belt!

And it's all made possible because of the recently developed "Flexon" process for making load-pulling V-belt cords *50% stronger than ever before!*

Then, on top of this — we float the cord section on a newly developed cool-running rubber cushion that absorbs operating shocks . . . provides maximum flexibility . . . dissipates internal heat . . . and assures longer life than ever before possible with any V-belt.

Finally — we wrap up the new belt in a two-ply wear-resisting cover that we "duplex-seal" for extra protection against dirt and moisture.

Built in true V-shape for greatest groove-grip action . . . and backed by famous Allis-Chalmers Texrope cooperative engineering—Texrope Super-7 is better and it costs no more!

Call your dealer or the nearby Allis-Chalmers district office. Or write us direct, asking for Bulletin B6190.

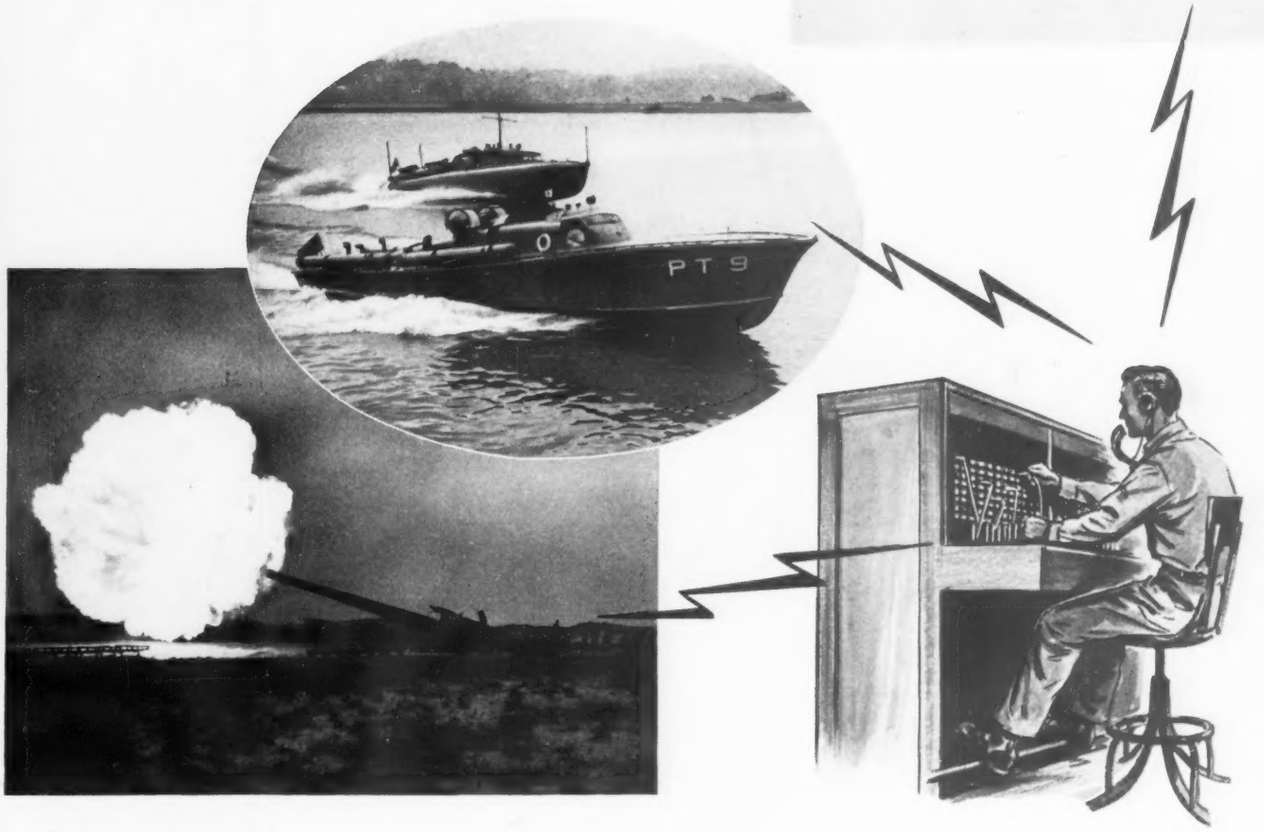
Available in All Sizes —
½ hp to 2000 hp

A 1452

*Trade mark registered U. S. Patent Office. Texrope Super-7 Belts are the result of the cooperative research and design genius of *two* great companies — Allis-Chalmers and B. F. Goodrich — and are sold exclusively by Allis-Chalmers.

ALLIS-CHALMERS
MILWAUKEE·WISCONSIN

WIRE Protects
the cable lines of coast defense



Long-range guns, dive bombers and torpedo-carrying assault boats are principal elements in American coast defense. In a crisis, the network of telephone lines between observation stations, airplane bases and artillery emplacements is essential to the coordination of striking power.

A humble yet vital job in protecting this network is performed by bethanized (zinc coated) wire, which is used as a wrapping for under-water cable sections of the coast defense communication lines. There's a double wall of bethanized wire around each lead-sheathed bundle of copper telephone lines.

Bethanized wire is selected for this work because it has a combination of improved corrosion-resistant and high physical properties.

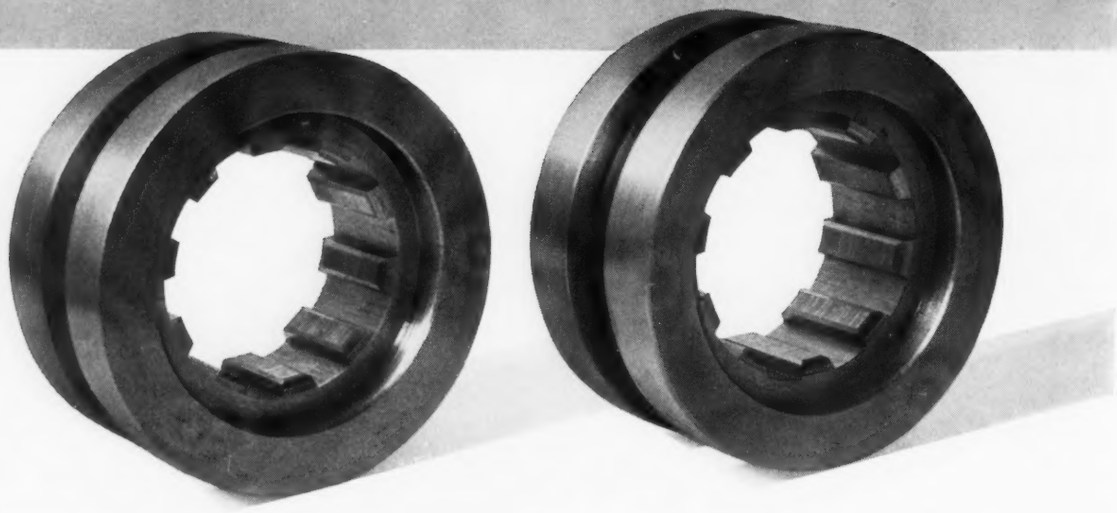
Being applied by electricity, the bethanized zinc coating is 99.9+ per cent pure, uniform in thickness over every inch of the wire. This coating offers unusual protection against salt-water corrosion, helps to assure that communication lines will be in perfect working order to handle any emergency.

BETHANIZED WIRE

BETHLEHEM STEEL

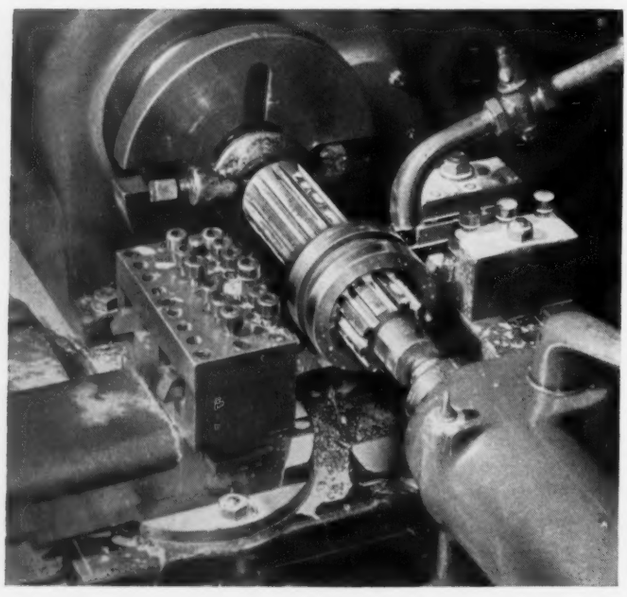
BETHLEHEM STEEL COMPANY

USE *Ingenuity* TO GET



Illustrated above is a heavy double jawed clutch, before and after being finished on a Monarch lathe, prior to cutting jaws and heat-treating. The operation consists of turning outside diameter, forming groove, straddle facing sides, necking groove diameter and chamfering 4 outside corners.

This job is representative of the thousands of simple parts being machined in large and small lots, where ingenuity in planning will save time and release men and machines for other work. In this plant, it is being done with a single setup on a Monarch 18″ Model BB lathe, with double connected rest, tool block in front, and multiple tool block in rear.



How this job is done

1. Press piece on spline arbor and place between centers in lathe.
2. Turn diameter, using tool held in rear tool rest.
3. Form groove, allowing for grind. This tool is held in the rear rest.
4. Straddle face sides, and chamfer, tools being held in front tool rest.
5. Neck diameter and sides of groove for grind relief.
6. Remove from machine and press off arbor.

Material—SAE-2350 steel. Tools—cemented carbide. Total time—8 minutes.

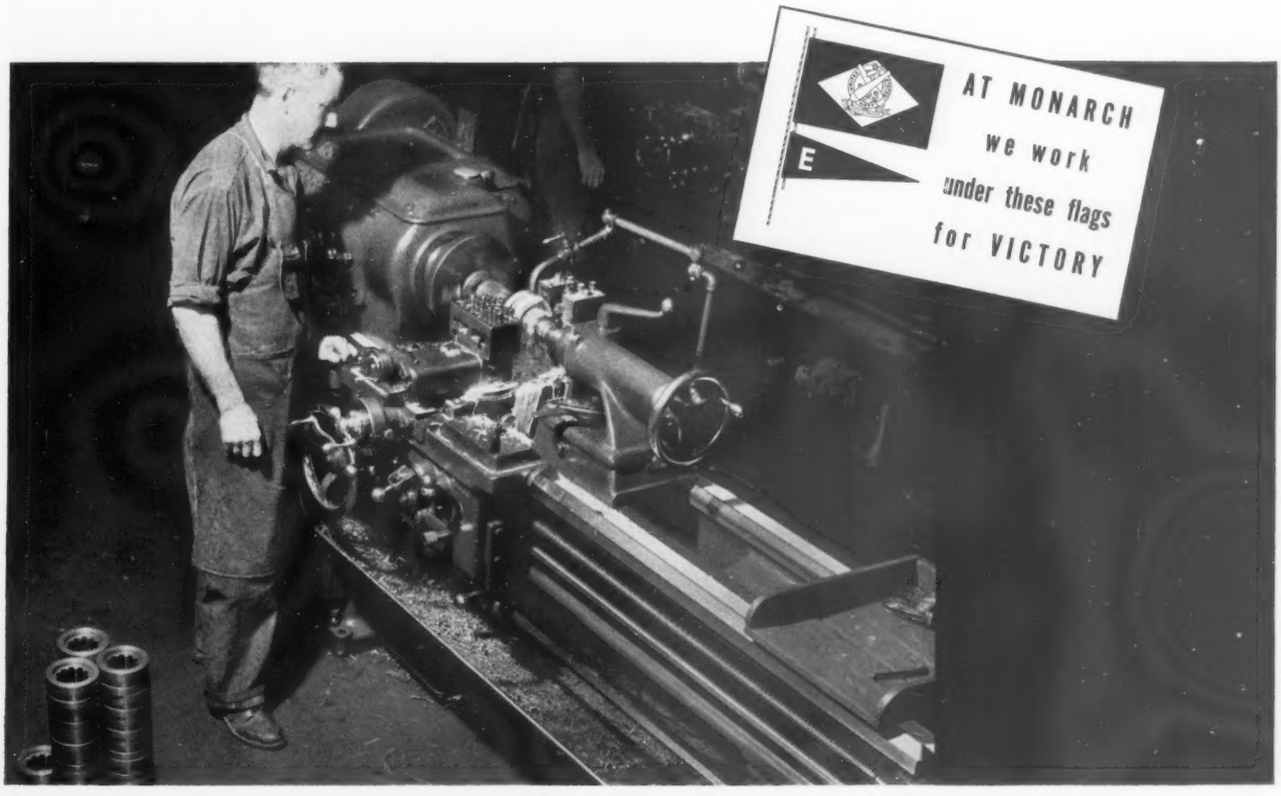
MORE WORK FROM MACHINE TOOLS

By using this method, one lathe and operator do the work with a single setup, instead of three separate setups, thus permitting more production from a single lathe.

This illustrates the ability of Monarch lathes to do a wide variety of work, valuable under our present production program. Their design and construction assure accurate performance, high productivity and long life. This is why Monarch lathes carry today's loads without faltering or lost time for maintenance and repairs. THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.

MONARCH LATHES

COVER THE TURNING FIELD



Behind the Scenes with STEEL

Immediate Success

■ STEEL's special section last week on Priorities, Allocations and Prices brought a more immediate and enthusiastic response from readers than anything we've done for many years. And it's easy to see why. It's the most complete and usable guide and reference to the entire OPM and OPA set-up of anything we've seen available at any price. Further it's just the beginning of regular new service in STEEL which will keep you right up to date on all current changes and revisions.

This week, under the heading, "Priorities, Allocations, Prices," you will find complete digests of new orders issued, amendments and revisions of previous orders, new forms to be used and a thorough coverage of all news and developments coming out of Washington this past week. This week-to-week job will enable you to keep your Priorities Guide complete and up-to-date, and then very shortly as these current changes jell a bit, an entire new section will be published to replace the present one.

Extra Copies Available

■ Extra copies of the January 12 Priorities Guide are still available but the supply melted away in a few days like a snowball in an open hearth charge. They are free of charge to regular subscribers in small quantities but we've had to put a nominal charge of 10c each on anything over 15 or 20 copies, if for example you are interested in placing a copy in the hands of each of your salesmen as some companies are doing. Address your requests to STEEL, Readers Service Department, Penton Building, Cleveland.

Arithmetickler

■ Our luncheon argument today for some unaccountable reason was not as per usual on the war but, of all things, on the sun. It all started very innocently when one chap, who describes himself off the record as an advertising man, simply stated that we nor anyone else can actually see the sun. Well, we argued it back and forth until we all had indigestion and a bad temper but just try to disprove what he says. The sun is, in round numbers, 92,000,000 miles away from us. It takes the sun's rays eight minutes and thirty-eight seconds to reach the earth. But in the meantime the sun has moved and is really two of its diameters away from the spot on which we seem to see it! Don't try to think about it too much, or it will drive you goofy.

New Reprint Handbook

■ A new addition to STEEL's series of reprint handbooks on ordnance production will soon be available and may be ordered now for prompt delivery as they come off the press. It is entitled "Modern Small Arms" and contains the complete series of articles by Professor Macconochie on the design and manufacture of the Garand rifle, Johnson semi-automatic, Reising and Thompson sub-machine guns, Browning machine gun, and the manufacture of small arms at Colt's Patent Fire Arms. Modern Small Arms will sell for $1.00 per copy, or a complete set of handbooks including Modern Shell Production and Modern Gun Production for $3.00.

Little "Tin" Soldier

■ With a gracious nod to Ted Robinson of the *Cleveland Plain Dealer*, which is currently celebrating its 100th year of publication, we pass along his reflections of the Christmas Toy situation during the recent holidays:

The little tin soldier this year is not wrapped
In the cellophane wrapper of yore;
And dumb is the little toy dog who once yapped
Through a gadget that's legal no more.
There is synthetic wool on the fat woolly lamb,
And the Teddy has counterfeit hair—
And don't let Old Santa Claus tell Uncle Sam
That your doll has a zipper down there!

Time was when the little tin soldier was tin,
And the brass cannon honestly brass—
When nickel and steel were common as sin,
And aluminum cheaper than glass.
Time was when the metals of very first grade
Were a part of our everyday plan;
When our toys were of copper and chromium made—
Except those we bought from Japan!

For all of the metal we wasted, of old,
Was carefully saved by the Jap,
Including the stuff we so eagerly sold—
Those shiploads on shiploads of scrap!
Now perhaps if we save what he's throwing at us,
We'll be happy next Christmas, for then
We shall give 'em to Santa Claus, jolly old cuss,
And he'll make us tin soldiers again!

A "Gold" Mine

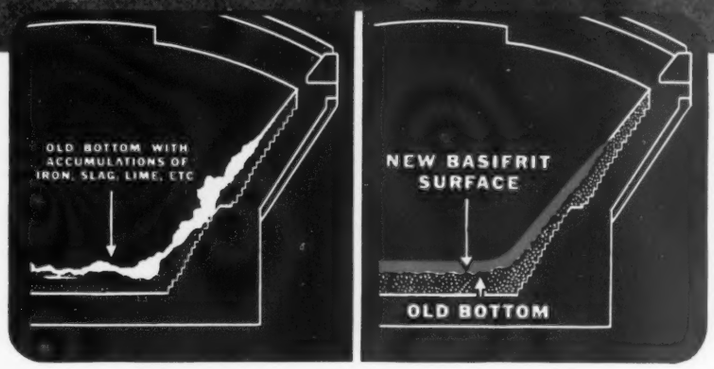
■ We never knew until this week that there are four and a half million tons of magnesium in a cubic mile of sea water—did you?

Defense Bonds:

Good Buy For You
Good Bye For Japs

Vol. 110, No. 3, January 19, 1942, issue of STEEL, published every Monday at Cleveland, O. Entered as second class matter at the postoffice, Cleveland, O., under act of March 3, 1879. U. S. and possessions, Canada, Mexico, Cuba, Central and South America, 1 year $6; 2 years $10; all other countries, 1 year $12. Current issues, 25c. Yearbook of Industry issue, $2.00.

SPEED PRODUCTION *with* BASIFRIT



Basic Refractories for the Steel Industry:

MAGNEFER — Dead-burned dolomite for hearth and slag line maintenance.

SYNDOLAG — Dead-burned dolomite, smaller in grain size than Magnefer.

BASIFRIT — Quick-setting magnesia refractory for new construction, resurfacing and general maintenance.

OHIO MAGNESITE — Domestic dead-burned high-magnesia grain refractory, equal to Austrian.

HEARTH PATCH — For deep hole patching and other quick repairs in the basic open hearth.

GUNMIX — A basic refractory with chemical bond, sized for use with a cement gun.

RAMIX — An air-setting basic refractory for rammed hearths and cold furnace repairs.

695 PLASTIC — Strong plastic with basic and neutral properties, for hot and cold repairs.

★ Keep your open hearths more steadily on the all-important job of making steel by using Basifrit for deep-hole repairs and for resurfacing.

This fast-setting, prepared magnesite can be installed in less than half the time required for the conventional magnesite-and-slag mixture; in addition, a Basifrit hearth stands up so well in severe service that it greatly reduces delay time for between-heat maintenance.

Proper installation is necessary for best results. Bottom holes should be rabbled clean of slag and metal and filled *quickly* with pure Basifrit, before slag and metal have time to flow back. No admixture of slag is normally needed. In fact, even in new hearth construction only 6% slag should be used with Basifrit.

Sixteen years of successful use by many operators prove the dependability of Basifrit. Now when every minute is more costly than ever before, you can *save time* with Basifrit, and save it *with safety*.

HIGH-GRADE PREPARED REFRACTORIES FOR THE CONSTRUCTION, MAINTENANCE AND REPAIR OF BASIC OPEN HEARTH AND BASIC ELECTRIC FURNACE HEARTHS

BASIC REFRACTORIES, INC.
FORMERLY BASIC DOLOMITE, INC. CLEVELAND, OHIO

Specialized machines—modern marvels of engineering — are a basic part of the carefully planned and coordinated production facilities, functioning a full 168 hours per week, which make it possible to manufacture Milwaukee Milling Machines in volume to the highest standards of machine-tool precision and quality.

This 15 ton, seven-spindle production unit was designed for machining T Slots in milling machine tables. It eliminates five independent cuts and increases production by more than 550% over ordinary methods. But what is most important — it insures a higher degree of accuracy than was previously obtainable

Milwaukee MILLING

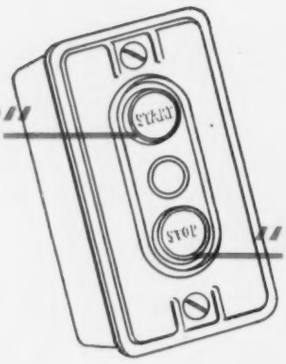
The full production capacity of our plants, the largest in the world devoted exclusively to the manufacture of milling machines . . . is dedicated to national security.

KEARNEY & TRECKER CORPORATION
MILWAUKEE, WISCONSIN, U. S. A.

KEARNEY & TRECKER
CORPORATION
Milwaukee
MILLING MACHINES

One of a series of advertisements describing specialized machines — originated, designed and built by Kearney & Trecker Corp. to assure the quality of Milwaukee Milling Machines under mass production.

M A C H I N E S • • • •

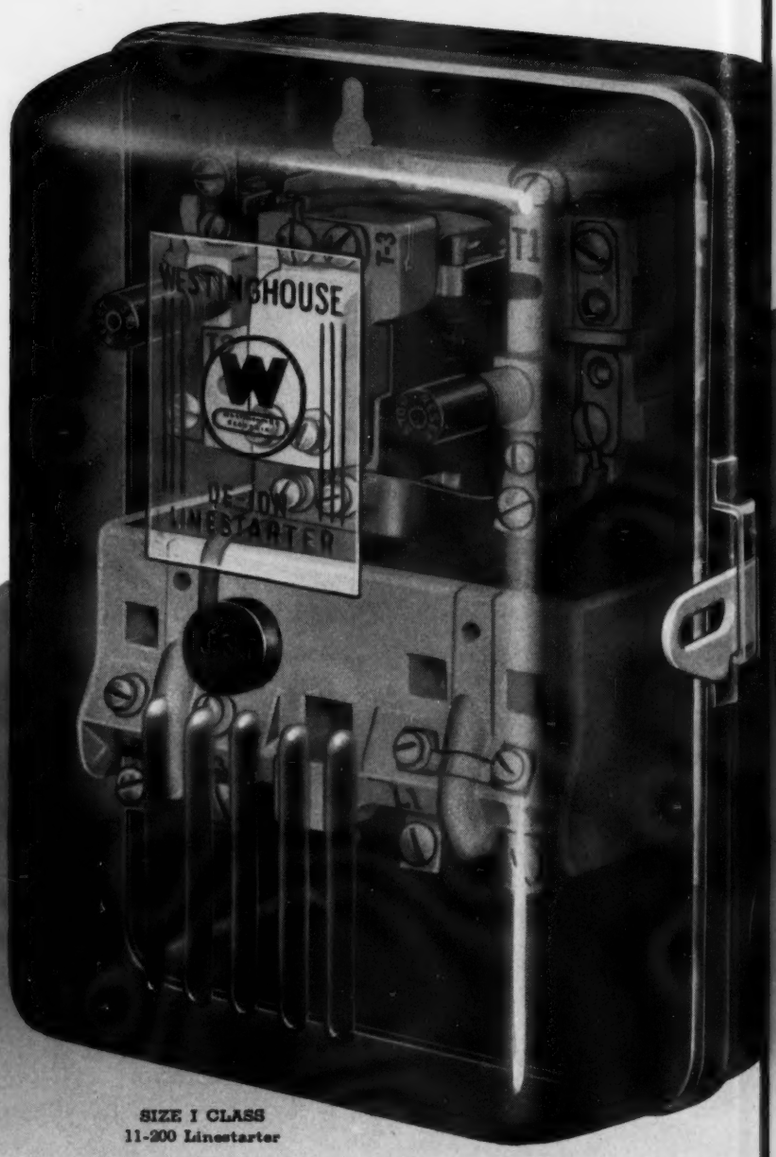


"START"

"STOP"

but no "maybe"

WITH WESTINGHOUSE "De-ion" LINESTARTERS

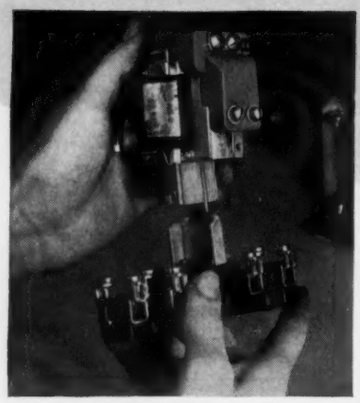


SIZE I CLASS
11-200 Linestarter

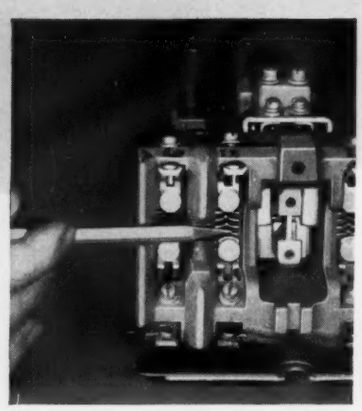
There's no "maybe" about the operation of the Westinghouse "De-ion" Linestarter. Simple, direct, vertical operation with just ONE moving part insures that the motor it controls will definitely "start" or "stop" without question or hesitation. Freedom from bearings and complicated linkages insures positive action. Vertical operation, as well, prevents the possibility of shocks causing accidental closing of the starter.

This basic feature, together with exclusive "De-ion" arc quenching protection for contacts, explains why Westinghouse Linestarters offer better protection against production interruptions on important circuits. Accurate, unvarying Bi-metal overload protection means further assurance for vital drives. Get these advantages today—check your nearest Westinghouse Agent.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.



VERTICAL OPERATION . . . JUST ONE MOVING PART . . . The armature and contact crossbar are a single unit that moves vertically.



"DE-ION" ARC QUENCHER PROLONGS CONTACT LIFE . . . When contacts open, arc is drawn into "De-ion" grids and instantly extinguished.

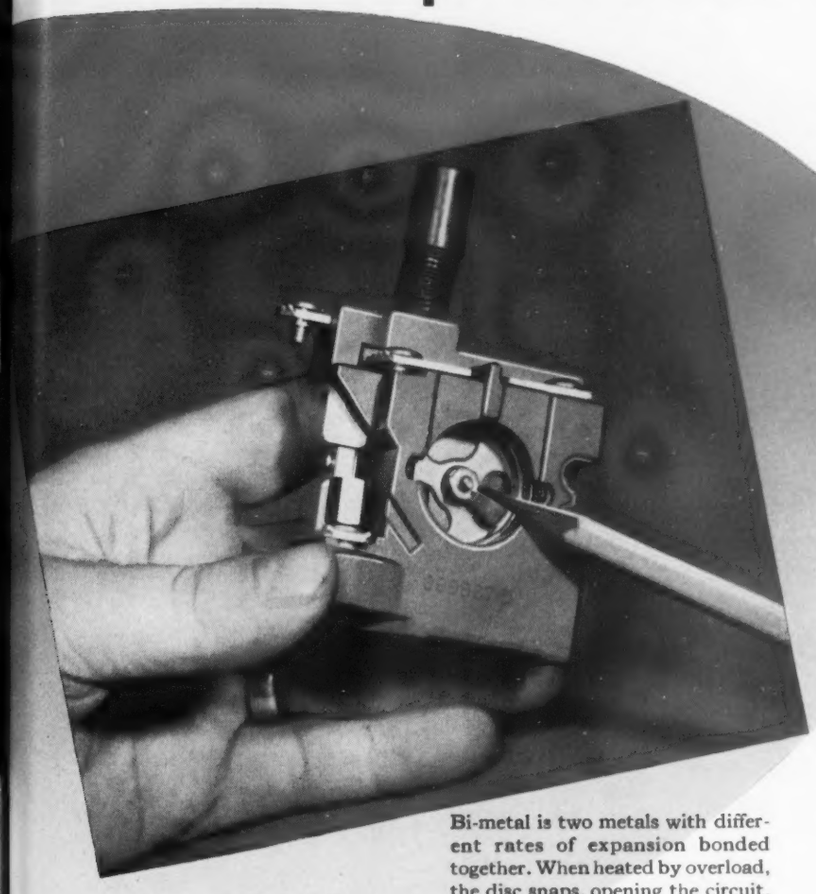
See our exhibit at the International Heating and Ventilating Exposition, Commercial Museum, Philadelphia, Pa., January 26-30, 1942.

Westinghouse

BI-METAL PROTECTION...

A WESTINGHOUSE FEATURE THAT MEANS

added protection FOR VITAL MOTORS



Bi-metal is two metals with different rates of expansion bonded together. When heated by overload, the disc snaps, opening the circuit.

Motor protection that operates when it doesn't need to, means unnecessary delays in production. Protection that is prevented from operating when it should, means even more expense in damaged motors or machines.

The BI-METAL disc relay—a Westinghouse development—solves both problems. It acts with uncanny accuracy to permit temporary overloads, as when motors are started across the line, yet snaps the circuit open with rifle-bullet speed when dangerous overloads occur. Factory-calibrated, it is always accurate and tamperproof. Automatic or self-resetting of relay after an overload cuts production time losses to a minimum.

BI-METAL is a basic protective feature of Westinghouse motor starters and circuit breakers—you get it at no extra cost. Use it for the added, accurate protection it affords—specify Westinghouse protective and control equipment. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

J-21185

THESE "De-ion" LINESTARTERS MEET SPECIAL REQUIREMENTS

FOR EXPOSED LOCATIONS ...weather-resisting, water-tight, dust-tight gasketed enclosure.

FOR ATMOSPHERES CONTAINING EXPLOSIVE VAPORS... Class I, Group D hazardous locations.

FOR ATMOSPHERES CONTAINING EXPLOSIVE DUSTS. (Class II, Group G hazardous locations) Ground-fitted cast-iron enclosure.

Motors and Control

WESTINGHOUSE

Hell-bent-for-election

THESE flying water-scats were designed almost beyond the power of men to control. As it is, the men must be heavily padded, lashed to their positions, to take the pounding of terrific speeds in rough weather.

Every part of these mosquito boats from gun to galley has been specified and manufactured to withstand the hard use that make the boats a powerful weapon of attack.

For rugged service in the heavy duty machines of war—and for delicate duty in the sensitive instruments of science go Barnes-made springs in endless streams from mass production lines, controlled by the engineering skill of veteran springmakers.

Wallace Barnes Company
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT, U. S. A.

How Chromium Steels

help to speed up refinery operations

CHROMIUM steels are resistant to corrosion and oxidation, and have high strength and hardness even at elevated temperatures. Because of this combination of properties, the use of chromium steels in oil refinery equipment keeps costly and time-consuming shutdowns for repair and replacement at a minimum and makes for fast, uninterrupted, economical operation.

The 4 to 6 per cent chromium steels are used for tubes, pump bodies, and transfer lines; the 12 to 14 per cent chromium steels for reaction chamber liners, pump parts, and valves; the 18-8 chromium-nickel stainless steels for distillation equipment, including trays, bubble caps, header boxes, and valves; and the 25-12 chromium-nickel steels for furnace parts, fractionating towers, and other applications where resistance to high temperatures is involved. The illustrations show a few applications which may suggest where you can use chromium steels to speed up production of petroleum products essential to National Defense.

We do not make steel of any kind, but we have for over 35 years produced "Electromet" ferro-alloys used in making steel. With the knowledge accumulated from this experience, we are in a position to give you, without obligation, impartial assistance in the selection of a chromium steel to suit your particular needs.

ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York, N. Y.

In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

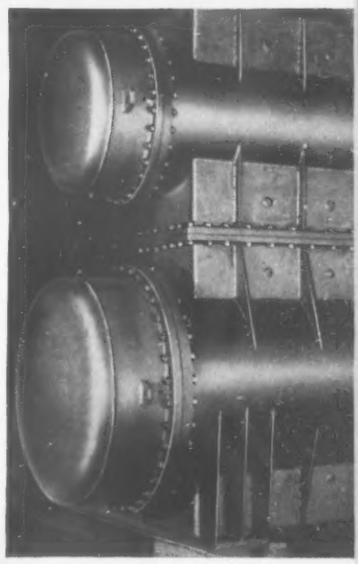
Above: Cracking still tubes of 18-8 chromium-nickel stainless steel withstand high temperatures and pressures.

•

Right: The 4 to 6 per cent chromium steels containing a small amount of molybdenum are being used for heat exchanger tubes and condenser pipe.

•

Below: Vessels lined with 12 per cent chromium steel withstand corrosion, and save weight.



4 — 6% Chromium Steels

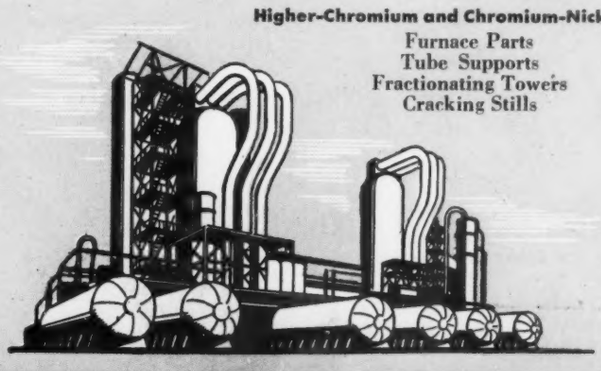
Tubes
Pump Bodies
Transfer Lines
Valve Bodies
Fittings
Return Bends
Preheaters

12 — 14% Chromium and 18-8 Chromium-Nickel Stainless Steels

Reaction Chambers
Oil Still Tubes
Distillation Equipment
Valves
Fittings
Header Boxes

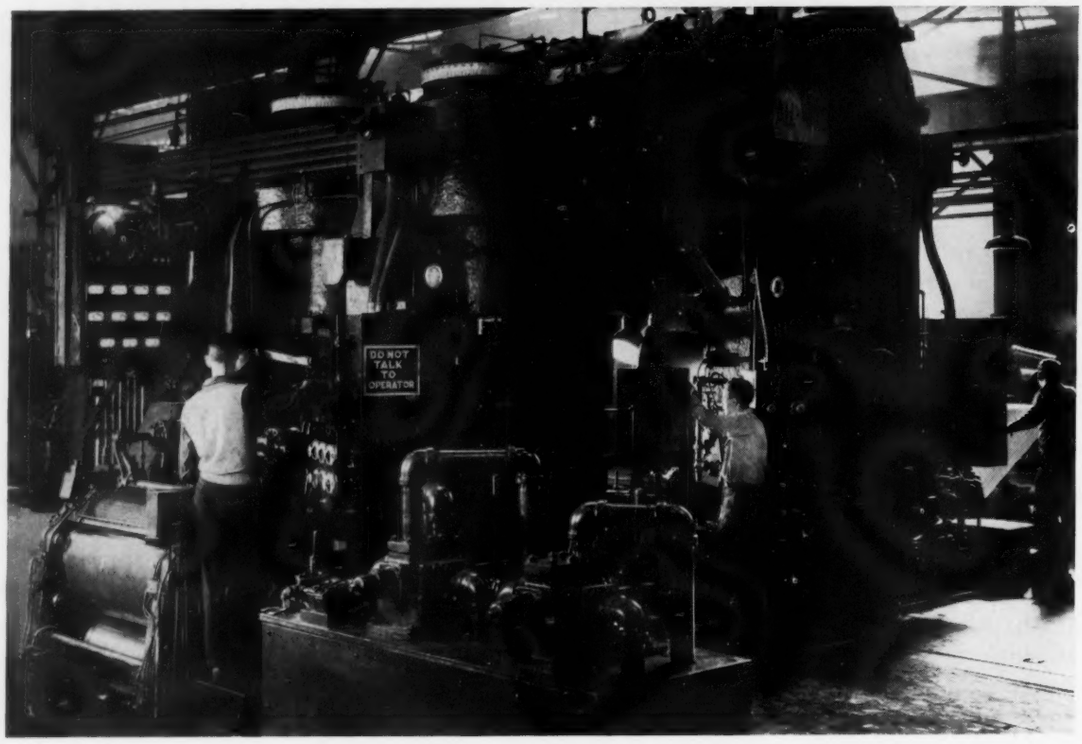
Higher-Chromium and Chromium-Nickel Steels

Furnace Parts
Tube Supports
Fractionating Towers
Cracking Stills



SOME USES OF CHROMIUM STEELS IN OIL REFINERIES

Electromet
Trade-Mark
Ferro-Alloys & Metals



Weirton's "DOUBLE CONTROL" of quality is control by men plus control by machines

We at Weirton appreciate that steel-making in many of its phases is, and always will be an art—one that requires not only equipment of the most modern design but also men who are masters in their craft.

At every step in the Weirton manufacturing process—from iron ore to the finished product—men and machines form a carefully coordinated team to give "double control" to the quality of Weirton steel. Steel that is uniform in high quality, meeting and satisfying the most exacting steel-user, is the result.

LIST OF PRODUCTS

Bars, Angles, Structurals, Piling, Hot and Cold Rolled Strip, Hot and Cold Rolled Sheets, Galvanized Sheets, Long Terne Sheets, WEIRITE Cold Reduced Tin Plate, Terne Plate—Special Coated Manufacturing Ternes, Tin Mill Black Plate, Lacquered Tin Plate and Black Plate.

NATIONAL STEEL

WEIRTON STEEL COMPANY—WEIRTON, WEST VIRGINIA

Sales Offices in Principal Cities

Division of

NATIONAL STEEL CORPORATION

Executive Offices, Pittsburgh, Pa.

IT WILL TAKE SPEED-

Whether it's now for rush production, or later for lower costs, speed becomes the most important element in metal turning.

Setting the pace for today's—and tomorrow's—swifter machining, Gisholt Ram Type Turret Lathes provide the fastest lever operated spindle speed control ever developed. The entire range of twelve speeds can be shifted in a few seconds. Or, if you want it still faster, selective automatic speed changing is available.

There's no lag with a coasting spindle when this machine is shifted to neutral. The work piece is stopped quickly by an automatic spindle brake. And you waste no time bringing tools into cutting position with Gisholt's automatic indexing and clamping of the hexagon turret. The operator can complete the whole cycle without taking his hand from the pilot wheel.

Minutes are vital! To win in war or peace, it will take speed.

GISHOLT MACHINE COMPANY
1217 Washington Avenue, Madison, Wisconsin

GISHOLT

LOOK AHEAD • • • KEEP AHEAD • • • WITH GISHOLT IMPROVEMENTS IN METAL TURNING

TURRET LATHES ★ AUTOMATIC LATHES ★ BALANCING MACHINES

The Press that Irons Out WORRIES

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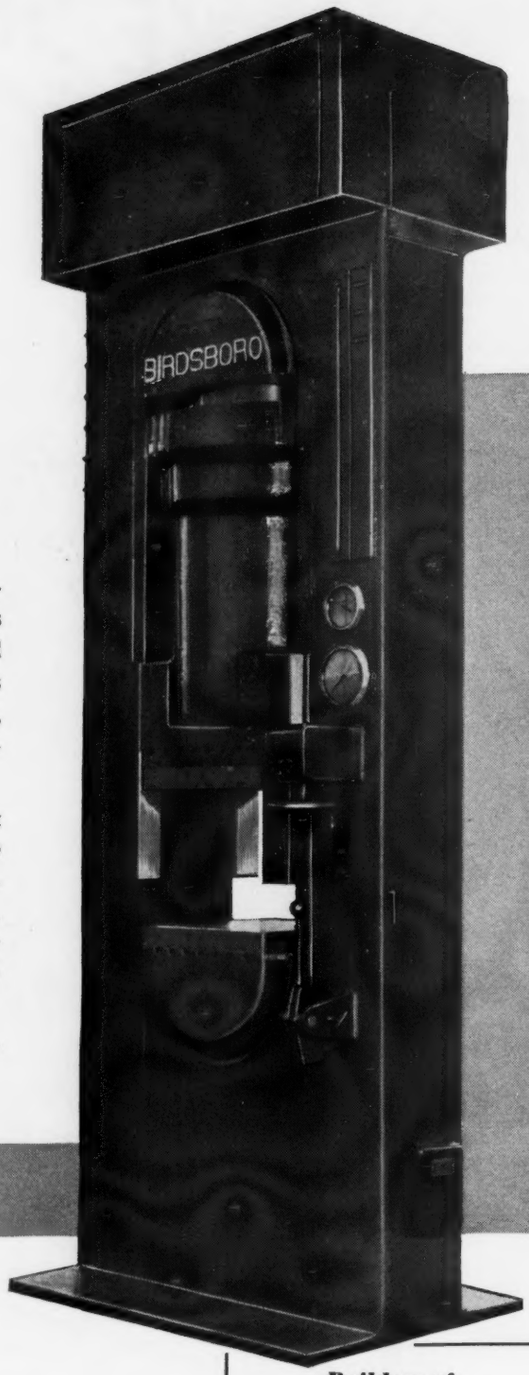

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STEEL

ESTABLISHED 1882

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HIGHLIGHTING
THIS ISSUE OF
STEEL

■ THE LONG-AWAITED appointment of a one-man control of wartime industrial production was the highspot of last week's news for industrialists who **(p. 21)** regard the move as paving the way for the fulfillment of the huge program which the President recently imposed on industry. Selection of Donald M. Nelson, with broad experience in business and in Washington, with a reputation for having the ability to get things done, was received with universal favor. It is expected that, almost immediately, the tempo will be stepped up, both in producing against existing contracts and in placing new contracts by which a much wider section of the country's facilities will be mobilized.

• • •

Tin More Restricted

Manufacturers of building material for defense housing should apply for priority assistance under the new Production Requirements Plan **(p. 32)**; tin is more tightly restricted; the petroleum industry has new priority help; a new order covers production and distribution of machine tools, gages, chucks. . . . Steel warehouses **(p. 31)** may obtain tires for trucks. . . . Chromium is tighter **(p. 29)**; premium prices are allowed on segregated aluminum scrap. . . . Warfare against misgrading of scrap **(p. 112)** is being intensified. . . . Extension of priority ratings **(p. 35)** has been simplified. . . . Analyzing the situation in alloy steels E. C. Smith **(p. 37)** warns that the specification of customary compositions no longer is possible; "we must produce from what we have."

• • •

Aliens on War Work

Sweeping restrictions apply to lead **(p. 34)**; lead price ceiling is higher; special copper for chemical use may be obtained by three companies; price inducements are offered to stimulate zinc, lead, copper output. . . . Mechanical measuring instruments **(p. 36)** are under a price ceiling. . . . The new tin smelter at Texas City will be enlarged **(p. 45)** to produce 30,000, instead of the originally planned 18,000, tons of tin annually. . . . Georgia low-grade manganese ore **(p. 48)** can be concentrated by a new process. . . . Employment of aliens on war production has the green sign. . . . Cold bar drawers will be under allocations **(p. 95)**. . . .Heavy truck production **(p. 22)** is to be stepped up. . . . The new War Labor Board now has hold of that hot poker **(p. 23)**, the closed shop issue.

• • •

Making Bomb Fuze Parts

A. L. Atherton tells **(p. 58)** how the method of statistical limits is applied to setting and holding dimensional tolerance limits on bomb fuze parts. A number of unique quality control methods are detailed. . . . Unusual development in design of cargo ships features low draft of only 11 feet fully loaded, is seen **(p. 64)** as a possible answer to the sub menace. . . . A. E. Gibson analyzes **(p. 72)** worm reduction drives for steel plant bridges. . . . New Arizona plant recovers **(p. 76)** base metal from old tin cans. . . . Francis A. Westbrook explains **(p. 80)** how adequate planning in an iron and steel foundry can facilitate production, yet require only a small amount of handling equipment.

• • •

Conservation, Reclamation

With conservation and reclamation of materials so important today, the methods **(p. 66)** employed by Caterpillar Tractor might well be adapted to many other plants. Often tools, parts and supplies are redesigned so what formerly was discarded when worn now can be used on some other job. . . . New rolling radiant-tube furnace **(p. 78)** is particularly suitable for heat treating shell bodies. . . . James H. Drumm Jr. relates how a steel plant grew in the jungles of Brazil. . . . According to Charles Hardy, the formation of powder metallurgical compacts in a vacuum has many important advantages. He describes **(p. 84)** the apparatus adapted to handle and work the metal powder under a vacuum.

Over a Million Soldiers Will Sleep on Cots of Inland Steel

To equip and maintain our Army, steel is needed in vast tonnages—not only for guns, tanks, shells and bombs—but also for such commonplace articles as beds, stoves, cans and lockers.

As an example—more than 14,000 tons of Inland rail steel already has been ordered for frames for Army cots. Soon these will be completed and in use and then over a million American soldiers will sleep on cots made of Inland steel.

Rolled from used railroad rails of the highest quality, Inland rail steel is particularly well suited for this purpose—not only because of its economy, strength and stiffness—but also because its use helps to conserve new ingot steel for the many other requirements of the defense program.

In the rail steel department and throughout the entire Inland organization men and mills are working at top speed to produce and deliver steel for defense when and where it is needed for our own and our Allies' armed forces.

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Greater, Faster Arms Production Goal of War Supplies Chief

Nelson warns War, Navy Departments and OPM he is prepared to make any necessary organizational changes to "lick Hitler and the Japs" . . . White House says his decisions will be final

WASHINGTON

■ BELATED establishment of a War Production Board under the one-man direction of Donald M. (Double-or-Nothing) Nelson was widely heralded by industry and the public last week. The move presages: (1) Stepping up conversion of civilian production facilities to war goods output; (2) reorganization in the defense agencies to eliminate much red tape and many interdepartmental jealousies.

Mr. Nelson sounded the keynote in a letter to OPM Director General Knudsen, Undersecretary of War Patterson and Undersecretary of Navy Forrestal:

"We have just one job to do — to make enough war material to lick Hitler and the Japs, and to do it in the shortest possible time.

"Any organizational changes that have to be made in order to do this job will be made. The present organization must and will evolve into the most effective possible instrument to do it."

Creation of the one-man control of wartime industrial production — urged by industrial leaders for many months past—was by a White House order. The War Production Board is granted all the powers formerly exercised by the Supply Priorities and Allocations Board, which it replaces. Mr. Nelson as chairman has final decision as to "questions of procurement and production."

The War Production Board (WPB) marks the fourth major step in a faltering evolution of the war production machine. The first was the appointment of the National Defense Advisory Commission, without power, and in which Mr. Nelson was director of purchases. The second was the establishment in early 1941 of the Office of Production Management, succeeding the advisory commission, and having somewhat more, although still inadequate, power. Last summer SPAB was created as an overall planning agency, while OPM maintained its identity and its heads became members of SPAB. A step forward, a part of SPAB's personnel was ineffective and there continued to be much overlapping and interlocking of authority and activities.

Gives Up Priorities Job

In addition to Mr. Nelson, the WPB membership includes all the members of the former SPAB. They are: Vice President Henry A. Wallace; Henry L. Stimson, secretary of war; Frank Knox, secretary of navy; OPM Director General Knudsen; OPM Co-Director Sidney Hillman; Price Administrator Leon Henderson; and Defense Aid Supervisor Harry L. Hopkins. Loan Administrator Jesse Jones also is a member of the new board.

Mr. Nelson will relinquish his job as priorities director.

Selection of Mr. Nelson as war production chief came in the midst of a wide-spread clamor for one-man control of the war effort. Nearly every newspaper columnist had a candidate for the job. The commentators' suggestions included such men as T. M. Girdler, chairman of Republic Steel Corp., Cleveland, and of Consolidated Aircraft Corp., San Diego, Calif.; Wendell L. Willkie, 1940 presidential candidate; Supreme Court Justice Douglas; Mr. Nelson, and a number of others.

Appointment of Mr. Nelson, however, was hailed even by those who had suggested other candidates. He has demonstrated hard hitting power and an enormous capacity for work. One of his first acts after becoming director of priorities was to call in a group of efficient correspondence experts over a week end and clear up thousands of accumulated applications for priority ratings, and to establish 48 hours as the maximum time for answering all ordinary inquiries and applications.

The new production "czar" was one of the first men in the country to comprehend the tremendous quantities of materials to be needed to wage effective war. His aides contend he prepared the figures on the number of planes, tanks, guns and ships needed which the President used in his recent message to Congress.

In addition to realizing the size of the order to be filled, Mr. Nelson admits practically nothing is

■ **Donald M. Nelson, chief of United States war production, grimly points to poster, as he declares to newsmen: "Our job is to make enough war materials to lick Hitler and the Japs—and to do it in the shortest possible time." NEA photo**

impossible. His credo: "If a thing needs to be done, it can be done."

Last week he commented: "It is perfectly obvious that nothing on earth counts from now one but doing this job just as fast as it can be done. How it is done does not matter in the least; by whom it is done does not matter; what it costs does not matter. Nothing matters but doing it."

That Mr. Nelson's powers will be real is indicated in the President's executive order which outlines his duties as follows:

"Exercise general direction over war procurement and production program; determine the policies, plans, procedures and methods of the several federal departments, establishments and agencies in respect to war procurement and production, including purchasing, contracting, specifications and construction; and including conversion, requisitioning, plant expansion and the finance thereof; and use of directives in respect thereto as he may deem necessary or appropriate." The chairman was further authorized to perform all the powers of SPAB, supervise the OPM in the performance of all of its duties and "direct such changes in its organization as he may deem necessary."

Another section of the order directed that federal departments, establishments, and agencies comply fully with the policies, plans methods and procedures relating to war procurement and production as determined by Mr. Nelson and these are required to furnish him with all necessary information in respect to these war functions as he may call for in performing his duties. The Army and Navy Munitions Board, furthermore, is required to report to the President "through the chairman of the War Production Board."

Apparently these powers preclude continuation of what has been one of the major deterrents to the armament program—sniping by self-seeking New Dealers. By the terms of the order, these men will have no voice in the reorganization of the defense agencies, and their clamoring for the subordination of industrialists and dollar-a-year men, particularly Mr. Knudsen, probably will be ineffective.

Just what form the reorganization will take had not been clarified at week's end. Whether OPM will continue to maintain its identity as such is in doubt. Reorganization of the OPM Iron and Steel Branch, which was nearing completion under Charles E. Adams, its recently-appointed chief, is being held up due to the creation of the WPB. Mr. Adams is reluctant to announce his new setup until the future of OPM itself is settled.

In the meantime, it is reported that a steel industry committee of practical mill executives has been selected to review the proposed expansion program. Difficulty has been experienced in obtaining materials and machinery for the new plants. To obtain preferred ratings for the proposed mills, approval of the Munitions Board, composed of representatives of the Army, Navy and Maritime Commission, must be obtained. Differences of opinion among the board members as to which plants should be built first have arisen, and the steel industry committee named to review the plans.

Buick Producing Aircraft Engines At Melrose Park

CHICAGO

■ Buick Motor Division, General Motors Corp., has started mass production of aircraft engines in its new $41,000,000 plant in Melrose Park. The first engine went into a test cell Jan. 8. Two hundred days after construction of the plant began, production of parts started, and another 43 days brought the first completed engine.

Ground was broken last March 17 for the main structure which contains some 1,320,000 square feet of floor space. Located at the rear of the main building are 46 test cells.

When full production gets under way, the plant will employ 15,000 persons, 10,000 on manufacture of parts and 5000 on assembly. Another 10,000 will be employed in the company's Flint, Mich., plant on production of parts to be shipped to Melrose Park.

The engine is the 1200-horsepower air-cooled type developed by Pratt & Whitney.

"Banks of parts, produced under the exacting requirements of precision and high quality necessary to war-time aircraft engine performance, are being built up after having passed rigid requirements," Harlow H. Curtice, president of Buick Motor Division, stated. "Meanwhile, assembly of engines, which commenced with completion of pilot line machinery and equipment, is going forward at an accelerated pace in an expanded manufacturing program that encompasses continuous 24-hour operations."

Increased Production of Heavy Trucks Authorized

Production of heavy or medium motor trucks in February, 1942, at a rate approximately 15 per cent greater than in February, 1941, will be permitted under an order issued by the Priorities Division.

During February, 53,435 heavy or medium trucks may be produced, as compared with 46,245 in the same month in 1941. These trucks, of a gross vehicle weight of 9000 pounds or more, serve many purposes in the war program.

At the same time, the division authorized a 138 per cent increase in production of passenger carriers this February over the same month last year. In February, 1055 passenger carriers may be produced, compared with an estimated 450 a year ago.

Closed Shop Issue Confronts New 12-Member War Labor Board

■ WHETHER the closed shop issue will be considered a proper subject for government mediation and arbitration is the major problem facing the 12-man War Labor Board appointed last week by the President.

The union shop was at stake in all of the seven disputes which have been certified to the new board by the secretary of labor and is prominent in the 22 old cases inherited from the former National Defense Mediation Board, which it replaced.

The new board differs chiefly from the mediation board in that it has broader powers, including that to appoint arbiters whose decision may be binding. It also will operate under a pledge from labor and management to settle all disputes peacefully and to declare a moratorium on strikes for the duration.

The executive order creating the board provided the following procedure for settling controversies which threaten to interrupt war production:

1. Parties at issue shall resort first to direct negotiations or to the procedures provided in collective bargaining agreement.

2. Failing to achieve settlement through such a negotiation, the Labor Department's conciliation commissioners must be notified, if they have not intervened already.

3. Should conciliation fail, the secretary of labor must certify the dispute to the board. However, the board, in its discretion, after consultation with the secretary, may take jurisdiction over the dispute on its own motion. The powers of the National Defense Mediation Board were limited to those disputes which the secretary of labor certified threatened to "burden or obstruct" the production of essential defense equipment. In practice, the secretary was slow to certify disputes commonly considered both burdensome and obstructive.

Six members of the new board were members of the mediation board, including W. H. Davis, New York patent attorney. Mr. Davis became chairman of the mediation board following the retirement of Clarence A. Dykstra, and has been appointed chairman of the new board.

Other members of the board are: Representing the public—Dr. Frank P. Graham, president, University of North Carolina; Dean Wayne L. Morse, University of Oregon Law School; George W. Taylor, University of Pennsylvania economics department. Mr. Taylor will be vice chairman.

Employers—Albert W. Hawkes, president, United States Chamber of Commerce, and president, Congoleum-Nairn Inc.; Roger D. Lapham, chairman, American-Hawaiian Steamship Co.; E. J. McMillan, president, Standard Knitting Mills Inc.; Walter C. Teagle, chairman, Standard Oil Co. of N. J.

Labor—Thomas Kennedy, secretary-treasurer, United Mine Workers of America-CIO; George Meany, secretary-treasurer, American Federation of Labor; R. J. Thomas, president of the United Automobile Workers-CIO; Mathew Woll, vice president, AFL.

Davis, Graham, Teagle, Lapham, Kennedy and Meany were members of the former mediation board.

"Automobile Dealers Will Be Granted Aid"

■ **WASHINGTON—Speaking to representatives of the National Automobile Dealers Association here. Price Administrator Henderson assured them dealers "will be granted aid in meeting losses" incurred through government orders freezing stocks of cars on salesroom floors, but warned them that war production would require complete cessation of "normal civilian vehicles production." One form of relief to dealers will be the use of their facilities to store an estimated 130,000 new cars under a "stockpile" plan, fixed storage charges to be paid by the eventual purchaser. NEA photo**

West Coast Aircraft Firms Seek Workers in Midwest

DETROIT

■ Aircraft companies are combing the Middle West for additional workmen for West Coast plants. Last week, employment representatives of Lockheed and Vega companies were in Cleveland and Detroit, seeking 190 toolmakers, 500 jig and fixture builders, 435 service mechanics, 75 layout draftsmen, 65 tool designers and 15 industrial engineers.

Robert C. Storment, employment manager for Lockheed, emphasized that he was not seeking to raid industries in these areas but rather trying to attract those who might have been made idle by automotive curtailment. Results have been disappointing so far, Storment revealing in Detroit that he had been able to find only 15 men out of the 1500 needed.

Wages offered range from 80 cents to $1.40 an hour; salaried jobs pay from $300 a month upward. Travel expense bonus of $75 is offered after 12 weeks' employment on new jobs.

Migration of labor from automotive and automotive parts centers is seen by some officials as creating a serious problem when the automotive plants have been retooled for war production, and are ready for rehiring of former production workmen.

11,000,000 Tons Of Steel May Be Exported in '42

NEW YORK

■ Approximately 9,500,000 tons of finished and semifinished steel will be exported this year under lease-lend agreements to Great Britain and her colonies, and Russia and China, principally to the former, according to reported estimates of OPM.

An additional lease-lend tonnage is understood to be scheduled for Central and South America, with the possibility that a total of 11,000,000 tons may thus be moved before 1943.

Allocations to Latin America of 28 materials and products were announced last week in Washington by Douglas C. MacKeachie, director of purchases, OPM.

Allocations for export in the first quarter this year include 375,000 tons of steel, $13,000,000 worth of miscellaneous farm machinery, 3,300,00 pounds of rayon, and 150,000 pounds of plastics. Chemicals made up most of the remainder.

OPM and Economic Warfare Board have been working on requests for 110 different allocations, Mr. MacKeachie said.

The number of new automobiles, amount of rubber and allotment of newsprint are among the allocations not yet completed. It is assumed that allocations similar to those allowed for the first quarter will be issued quarterly for the remainder of the year, he stated.

Republic Adds Electric, Blast Furnace Capacity

■ Republic Steel Corp., Cleveland, last week broke ground at its Chicago plant for installation of six 70-ton electric furnaces, with total annual capacity 500,000 tons.

Contract has been let by Republic to Standard Boiler & Plate Iron Co., Niles, O., for an 1100-ton blast furnace at its Youngstown, O., plant.

Price Schedule for Used Steel Barrels Modified

Price schedule covering used steel barrels or drums has been modified to assure dealers and peddlers an adequate operating margin.

Effect of the change is to establish a ceiling price of $1.25 each for "raw" used steel barrels or drums (50 to 55-gallon capacity, 18-gage steel) when sold by the emptier to "any person." Formerly the schedule only imposed this ceiling price when such drums were sold direct to users. This left sales by emptiers to others than users free of any restriction. Prices were bid up and, since peddlers and dealers could only charge $1.60 upon the resale, their operating margins narrowed to the point that they were in danger of being forced out of business.

♦ ♦ ♦

Any Brass Mines, Today?

■ The Bureau of Mines recently received a phone call from an official of the OPM metals and minerals division asking about "brass mines."

"What are you trying to do, kid us?" said a BM expert. "What do you mean, kid you?" protested the OPM-er. "I'm serious. We want to find out all we can about brass mines—how many there are in the country, where located and the total annual production of brass ore."

"Mister, we'd like awfully well to accommodate you," was the flabbergasted reply. "But any schoolboy can tell you that there just is no such animal as a brass mine. Brass is an alloy made chiefly of copper and zinc." — *Pearson and Allen, Washington comment, Cleveland News.*

No Need for More Rail Control, Says Eastman

■ There is no immediate prospect that government ownership or priorities will be needed to adapt the railroads and other transportation systems to wartime demands, Joseph B. Eastman, director of transportation, indicated last Friday. Thus far the transportation agencies of the country have taken care of the traffic needs exceedingly well, Mr. Eastman said in a public statement.

Rate of increase in traffic this year over 1941 soon will be accelerated, F. E. Williamson, president, New York Central System, stated. Weather conditions affected loadings on New York Central recently, although the first ten days of January showed an incease of 2 per cent over the comparable period in 1941.

Speaking as chairman of the Eastern Railroads Presidents Conference, Mr. Williamson said: "In every way possible the railroads of the East are preparing for the flood of industrial and military traffic which seems sure to face them in the coming months. Remarkable as was their record last year even more intensive effort coupled with additional equipment now on order will be required. Steps toward accomplishing this are now under way."

Mobile Garage Prepared for Combat Service

■ **CAMP CALLAN, CALIF.: A four-ton "wrecker" with nearly all the appurtenances of a garage, has been developed to make rapid repairs under battle conditions. Here it is—as much as may be shown—lifting up a "jeep", for members of the maintenance unit. NEA photo**

Plate Fabricators Ask Survey of Facilities

■ Steel Plate Fabricators' Association, 37 West Van Buren street, Chicago, at its annual meeting passed a resolution assuring the government its first interest is to do everything within its power to assist in the war effort, regardless of any profit motive.

The resolution also called for "a complete survey of all facilities and trained manpower still available in order that same may be devoted to the patriotic support of our government, thus assuring the maximum saving of time and the unnecessary expenses involved of providing new plants in this emergency, when equipment as well as trained personnel are needed so badly in many other industries."

Steel Inventories Higher in November

■ November index of the value of steel manufacturers' inventories was 127.8, compared with 125.9 in October and 124.0 in November, 1940, taking 1939 at 100, according to the monthly survey by the Department of Commerce.

Index of the value of new orders received by steel mills in November was 212, compared with 213 in October and 214 in November, 1940, taking January, 1939, at 100.

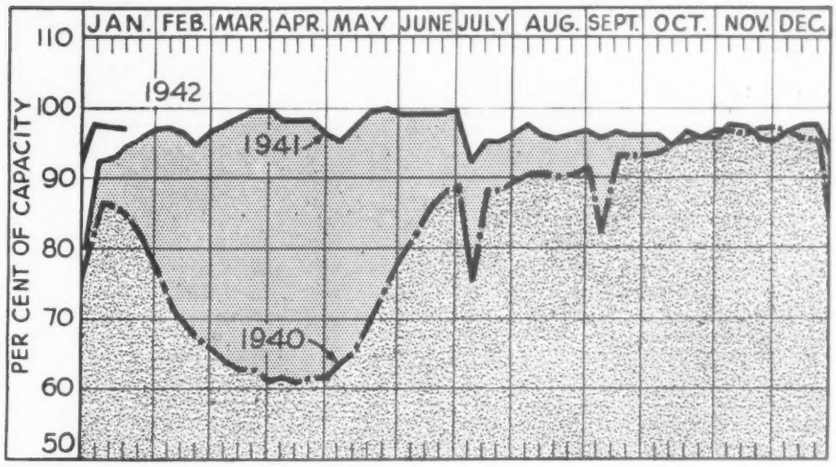
Value of shipments of steel mills in November was 252, compared with 255 in October and 176 in November, 1940, based on January, 1939, as 100.

There was a decrease of 2 per cent in November of last year compared with October in the value of steel manufacturers' unfilled orders while in November of last year there was an increase of 152 per cent in the unfilled orders compared with November, 1940.

Air-Conditioned Blast Furnaces Aid Defense

■ Sufficient steel to build a large battleship can be made from additional pig iron produced in four months by air conditioning an average size blast furnace, R. V. Dunne, steel industry engineer, Carrier Corp., Syracuse, N. Y., told members of the Association of Iron and Steel Engineers, Detroit chapter. The iron will be of more uniform quality and less coke will be consumed, he stated.

Carrier is building air-conditioning equipment for blast furnaces in this country and as far away as India. Installation requires a few months.



CURRENT PRODUCTION . . . Down

■ PRODUCTION of open-hearth, bessemer and electric furnace ingots last week was reduced ½-point to 96 per cent as lack of scrap caused additional open hearths to suspend. Three districts made slight increases, four declined and five were unchanged. A year ago the rate was 94½ per cent; two years ago it was 84½ per cent.

Youngstown, O. — Curtailment because of scrap shortage cut operations last week 6 points to 84 per cent, with 65 open hearths and three bessemers in production. Youngstown Sheet & Tube Co. took off three open hearths and Republic Steel Corp. two at the beginning of the week and Carnegie-Illinois Steel Corp. added one at the beginning and another at the end of the week. Slight improvement is expected this week.

Central eastern seaboard—Production continued unchanged at 89 per cent as scrap supply held steady.

Birmingham, Ala.—With 22 open hearths active the production rate held at 90 per cent. Furnaces under repair will resume soon.

Cincinnati — Only two open hearths are idle, under repair, and the rate is 91½ per cent for the third week.

St. Louis—Lighting of an additional open hearth increased production 5 points to 81 per cent.

Chicago—Need for repair caused shifts in open hearths and resulted in a drop of 1 point to 101 per cent.

New England—Repairs to the one idle open hearth have been completed and production again is at 100 per cent.

Pittsburgh—Unchanged at 95 per cent, only lack of scrap preventing capacity production.

Wheeling—Declined 1 point to 89 per cent as equipment was shifted.

Buffalo—Scrap shortage and repairs hold production unchanged at 79½ per cent.

Cleveland—Down 2½ points to 90 per cent, from a revised 92½ per cent for the preceding week.

Detroit—Gained 4 points to 86 per cent as one interest was able to relight two open hearths at midweek as additional scrap was obtained.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Jan. 17	Change	Same week 1941	Same week 1940
Pittsburgh	95	None	95.5	82
Chicago	101	— 1	98.5	92
Eastern Pa.	89	None	96	80
Youngstown	84	— 6	94	74
Wheeling	89	— 1	100	96
Cleveland	90	— 2.5	95.5	82.5
Buffalo	79.5	None	90.5	70
Birmingham	90	None	100	94
New England	100	+ 8	100	83
Cincinnati	91.5	None	88.5	74.5
St. Louis	81	+ 5	87.5	83
Detroit	86	+ 4	95	91
Average	96	— 0.5	94.5	84.5

Otis Steel Sets Four New Production Records

■ Otis Steel Co., Cleveland, broke four all-time records during 1941. Operating at nearly 19 per cent above its rated capacity of 927,000 tons the company reports it produced 1,028,266 tons of ingots. The 77-inch continuous hot mill, one of the first installed in this country, broke all prior records by 93,941 tons. Pig iron production exceeded the previous high by 5.9 per cent.

The 1929 record of 80,000 tons of steel plates at the Lakeside plate mill was exceeded by an additional 24,000 tons.

MEN of INDUSTRY

■ **GEORGE H. WOODARD** has been appointed manager, new products division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Mr. Woodard joined the company in 1936, when the new products division was created, and after serving as new products engineer at the South Philadelphia works two years, he was transferred to the division's headquarters at East Pittsburgh in 1938. He will continue as executive assistant in the company's emergency products division.

♦

James F. McNamara, mill products sales manager, International Nickel Co. Inc., New York, has been elected a director, Lukens Steel Co., Coatesville, Pa. **Warren H. Snow,** president, E. H. Rollins & Sons Inc., New York, has also been elected a director of Lukens.

♦

Horace Bassett has been promoted to factory manager, Wolverine Tube Co., Detroit.

♦

Clarence Maitland, for more than 50 years head of the invoice section, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has retired.

♦

Charles L. Jones, president, Jones-Atkinson Corp., has been elected director, Continental Can Co. Inc., New York.

♦

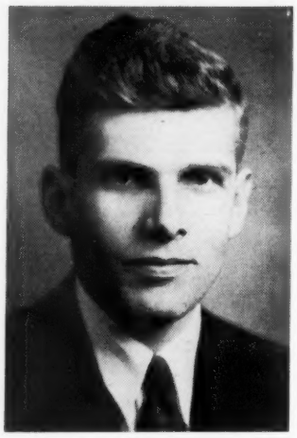
W. M. Smothers has been named industrial agent, Baltimore & Ohio Chicago Terminal Railroad Co. and Alton Railroad Co., with headquarters in Chicago.

♦

Frank H. Boyd, for 30 years divisional manager, Cleveland territory, American Seating Co., has been appointed sales manager, S. G. Frantz Co. Inc., manufacturer of magnetic separators, New York.

♦

S. P. Flenniken Jr., formerly district manager, Indianapolis office, Berger Mfg. Division of Republic Steel Corp., has been made branch office manager in Chicago for the company. He succeeds **William A. Harris Jr.,** who leaves to become associated with his father in the pottery business in Liverpool, O. **Allen C. Rudy,** of the Chicago sales staff of Berger, will succeed Mr. Flenniken as district manager at Indianapolis.



George H. Woodard

J. F. McNamara

Bert M. Brock
Who has been appointed manager of industrial relations, John A. Roebling's Sons Co., Trenton, N. J., as announced in STEEL, Jan. 12, p. 29

♦

A. W. Herrington, president, Marmon-Herrington Co. Inc., Indianapolis, was elected president, Society of Automotive Engineers, at the society's annual meeting in Detroit last week.

♦

Walter E. Bisler has been appointed Pittsburgh district sales manager, Pomona Pump Co., with headquarters in the Grant building. He formerly was sales engineer for the Combustion Engineering Co. in the Pittsburgh office.

♦

Karl W. Fischer has been appointed assistant to the president, Chicago, Burlington & Quincy railroad, Chicago. He recently returned from 19 months in Washington as deputy transportation commissioner of the advisory commission to the National Defense Council.

♦

R. S. Hood Jr., district sales manager, J. G. Brill Co. and The a.c.f. Motors Co., has transferred his offices from St. Louis to 423 South Field street, Dallas, Tex., where an extensive a.c.f. Service Parts Station recently was opened.

♦

Walter A. Bowe, advertising and public relations manager, Carrier Corp., Syracuse, N. Y., has been elected director-at-large of the National Industrial Advertisers Association Inc., Chicago, to fill the unexpired term of **R. D. Hawkins,** resigned.

♦

Charles A. Reichelderfer has joined the research staff at Battelle Memorial Institute, Columbus, O., and has been assigned to the division of nonferrous metallurgy. He formerly was associated with Jones & Laughlin Steel Corp., Pittsburgh.

♦

John McBroom has joined the engineering staff of Hydro-Arc Furnace Corp., Chicago. After graduating from the University of Minnesota in 1936 he joined Duraloy Co., Scottdale, Pa., as metallurgist, and

subsequently was in the service and sales department of Pittsburgh 'Lectromelt Furnace Corp., Pittsburgh, leaving that post in May, 1941, to do experimental work on an ore reduction process in Longview, Tex.

♦

Charles E. Quay, formerly superintendent, has been named general manager, Ohio Tool Co., Cleveland, manufacturer of small arms and ammunition tools. The company, of which **L. E. Butzman** is president, has expanded considerably the past year, now operating two plants and employing 700 men.

♦

Haldwell S. Colby has been appointed divisional vice president, Locomotive division, Baldwin Locomotive Works, Philadelphia. **Frank K. Metzger** has become divisional vice president, Standard Steel Works division, while **Frederick G. Schranz** and **Norris H. Schwenk** have been named divisional vice presidents, Baldwin Southwark division, and Cramp Brass and Iron Foundries division, respectively.

Other appointments in the locomotive division include **Amos G. Cole** as works manager and **Lewis W. Metzger,** production manager, reporting to Mr. Colby.

Ralph W. Anderson, formerly superintendent of motive power, Chicago, Milwaukee, St. Paul and Pacific railroad, has been appointed assistant to Mr. Colby, with particular reference to steam locomotive construction.

♦

H. P. Bigler, the past 16 years director, Rail Steel Bar Association, has been appointed assistant to the president, Connors Steel Co., Birmingham, Ala. Mr. Bigler recently was named chairman of the OPM Technical Advisory Committee on Reinforcement Steel under the Division of Emergency Specifications.

W. H. Jacobs, the past three years engineer, Rail Steel Bar Association, Chicago, has been named secretary-director, succeeding Mr. Bigler.

♦

R. D. Lawson has been appointed salesman for Machine Division, Norton Co., Worcester, Mass., for northern New England, including Vermont, New Hampshire, Maine and parts of Massachusetts and Rhode Island. He succeeds **W. E. Wickstrom,** who takes over sales engineering work at the main office in Worcester.

James K. Stevenson and **Paul F. Sparrow** have been named salesmen for the Refractories Division of Norton, with headquarters in Chicago and Pittsburgh, respectively.

DIED:

■ **G. Cook Kimball,** 62, executive vice president, United States Steel Corp. of Delaware, at Chicago, Jan. 12, in that city, after long illness. He devoted his entire business career to the steel industry, beginning as an engineer with American Tin Plate

G. Cook Kimball

Co. in 1901 after graduation from Harvard University. He was executive vice president, Carnegie-Illinois Steel Corp. from 1935 until April, 1939.

♦

Charles J. Brittain, 64, chairman of the board and president, Canadian Fairbanks-Morse Co. Ltd., Montreal, Que., in that city, Jan. 11. He had been associated with the firm 40 years.

♦

Howard C. Molsberry, 56, production manager, Truscon Steel Co., Jan. 7, in Youngstown, O.

♦

Clarence J. Flath, 58, secretary, O. S. Flath Co., Chicago, railway supplies, in that city, Jan. 5.

♦

Dr. Leon Pratt Alford, 65, chairman, department of administrative engineering, New York University, Jan. 2, in New York. Dr. Alford was an honorary life member and a former vice president, American Society of Mechanical Engineers, and was a former vice president, American Engineering Council.

♦

Alfred E. Putman, 56, vice president and director, Macdonald Engineering Co., Chicago, at his home in River Forest, Ill., Jan. 6.

♦

Thomas H. Morcom, 57, since 1931 general factory superintendent, General Railway Signal Co., Rochester, N. Y., Jan. 11, in Rochester.

♦

Jacob S. Goldman, 64, president, United Brass & Aluminum Co., Port Huron, Mich., in that city, Jan. 2.

♦

Charles H. Evers, 56, former head of Evers Iron Works, Cleveland, Jan. 11, in that city. The company was dissolved several years ago.

♦

T. Boyd Spiller, 67, who retired two years ago as superintendent, Bridgeton, N. J., plant of American Can Co., Jan. 10.

♦

Edward Probst, 71, last surviving original member of Graham, Anderson, Probst & White, Chicago, architects, at his home in River Forest, Ill., Jan. 9.

♦

Richard F. Anderson, 63, for 35 years district sales manager, Hibbard, Spencer, Bartlett & Co., Chicago, Jan. 9, in that city.

♦

Ernest H. Geyer, 44, president, Five-Way Expansion Joint Co., Chicago, in that city, Jan. 10.

♦

Louis I. Passman, 49, a member of the firm of Passman Bros. Inc., Chicago, Jan. 14, in that city.

Screw-Thread Standards Handbook Available

■ Thousands of widely separated plants producing interchangeable parts which must fit into planes, tanks, guns and other equipment assembled in the all-out war production program will find guidance in National Bureau of Standards Handbook H28 *Screw-Thread Standards for Federal Services* just released.

This publication, brought out by the Interdepartmental Screw-Thread Committee representing the War, Navy and Commerce Departments, supersedes Handbook H25 and includes various extensions, revisions and additions.

Its purpose is to present complete dimensional data upon which specifications may be based for a wide variety of threaded products needed to meet government requirements.

Carrying the formal approval of the Secretaries of War, Navy and Commerce, the standards set forth in the publication are mandatory, except where need for deviation is shown in specific instances.

For the most part the federal standards conform to generally accepted commercial standards, with some exceptions made necessary by particular needs of the federal services.

Copies of Handbook H28 may be obtained from the Superintendent of Documents, Washington, at 35 cents per copy.

Activities of Steel Users, Makers

■ REVERE Copper & Brass Inc. placed in partial operation Jan. 1, five months ahead of schedule, its new $10,000,000 plant in Chicago to produce cartridge cups, bullet jackets and ordnance brass. Output is increasing as rapidly as equipment can be installed.

♦

United Drill & Tool Corp., 411 West Ontario street, has acquired a seven-story factory building west of its present location which provides approximately 180,000 square feet of floor space, or twice present facilities. In the transaction, the corporation also took title to its present plant, occupied under lease since 1937.

♦

Kropp Forge Co., Chicago, maker of steam hammer, drop and upset forgings, has been awarded the United States Navy ordnance flag and the Navy's blue "E" pennant. Approximately 96 per cent of the company's forging capacity has been set aside for national defense.

♦

Viber Co. has moved to larger quarters at 726 South Flower street, Burbank, Calif.

♦

Pollak Steel Co., Cincinnati, has sold its plant in Carthage, used for fabricating reinforcing steel and as a warehouse, to the Ridgewood Steel Co. which is engaged in war production. The sale of the Carthage property in no way affects the business of the Pollak company.

♦

Oakite Products Inc., New York, manufacturer of industrial cleaning materials, has established a New England division at 410 Asylum street, Hartford, Conn., in charge of T. R. Smith, and has also opened a St. Louis and Southwestern division with headquarters in St. Louis, in charge of S. C. Shank.

♦

Alvey-Ferguson Co., Cincinnati, has increased production 25 per cent by completion of the first unit of an expansion program. Enlarged facilities were made necessary by increased demand for especially designed conveying equipment and product washing machines for use in plants producing shells, cartridges, gun barrels and other defense items.

♦

Standard Stamping & Perforating Co., 3131 West Forty-ninth place, has purchased from Phipps Land Trust the site and one-story building which it has occupied under lease.

♦

Weinman Pump & Supply Co., Pittsburgh, has moved to larger quarters at 207 Boulevard of Allies in order to expedite handling of defense contracts.

♦

Fruehauf Trailer Co., Detroit, has purchased plants of Koppers Co. in Fort Wayne, Ind., and will use the facilities to manufacture heavy-duty haulage equipment. Covering 200,000 square feet, they include a plate shop, warehouse, machine shop, power house and miscellaneous buildings, adapted for heavy construction.

♦

International Nickel Co. Inc. has moved the Detroit office of its development and research division from the tenth floor of the General Motors building to room 8-217, of the same building.

♦

Gray Iron Founders' Society Inc. has moved its Washington office to Apartment 400, 2633 Sixteenth street, Northwest.

♦

Mine Safety Appliances Co. of Canada Ltd., subsidiary of Mine Safety Appliances Co., Pittsburgh, has established a new office at 139 Kendal avenue, Toronto, Ont., and will carry a complete line of safety equipment. R. Morris, general manager, will make his headquarters in Toronto. The company operates district offices in Montreal, New Glasgow, and Sidney, N. S.

♦

Surface Combustion Corp., Toledo, O., has changed its name to Surface Combustion Division of General Properties Co. Inc. This change does not affect the present organization and it will continue to operate as a separate unit, a division of the parent company instead of a subsidiary.

Blind Workers Sort Aircraft Rivets by Sense of Touch

NEW YORK

■ Skilled hands and sensitive fingers of blind workers are participating in a novel manner in building warplanes, by sorting rivets at the New York Association for the Blind's Lighthouse.

Rivets swept up from floors of aircraft factories include as many as eight sizes and shapes. Some of them are so nearly alike as to be difficult to distinguish by sight, and they cannot be separated and graded readily by mechanical means.

Before pressure for airplane production had reached its present stage and there were no priorities on aluminum and other metals the rivets dropped on factory floors were swept up and sold as waste metal.

Despite the time required to handle and sort the rivets the work is being done profitably for the factories and the blind.

Eleven Months' Exports $4.5 Billion; Highest Valuation in Eleven Years

WASHINGTON

■ DEPARTMENT of Commerce reports United States exports for October and November aggregated $1,157,000,000. General imports totaled $585,000,000 for the two months.

In accordance with previously announced policy the department will withhold detailed foreign trade figures for duration of the war, although information on total values will continue to be made available.

For the first 11 months of 1941 total exports were valued at $4,492,000,000, highest figure in 11 years, the department reported, and an increase of 21 per cent over the first 11 months of 1940. The increase, while largely due to an expansion in volume of shipments, was partly influenced by increase in commodity prices.

Imports for 11-month period of last year amounted to $3,002,000,000. against $2,372,000,000 in like period of 1940, an increase of 27 per cent.

Control Over Chromium Tightened Further

Further tightening of control over chromium, is effected by an amendment to Order M-18-a.

Amendment prohibits any person from melting more than two tons of ferrochrome in any one month without specific authorization of the director of priorities.

Purpose of the amendment is to prevent using up inventories of ferrochrome to fill less essential rated orders for chrome steel. Together with M-21-a, the chrome steel order, this regulation is designed to limit chrome steel to vital military needs.

Amend Price Ceilings for Segregated Aluminum Scrap

Rearrangement of maximum prices for aluminum "plant" scrap, to facilitate operation of the segregation order issued recently by OPM, was announced last week by OPA.

To accomplish the objective of encouraging segregation of scrap, the amendment makes two changes to permit primary producers and secondary smelters to pay premium prices: (1) It eliminates from the schedule all segregated solid plant scrap, except 2S (pure aluminum), and (2) it establishes a one-cent differential between segregated and unsegregated (mixed) turnings and borings. It was pointed out that the greater usefulness of segregated scrap enables purchasers to pay premiums and so provide an incentive for manufacturers to segregate their scrap more carefully. No change is made in the ceiling prices of unsegregated plant scrap and "obsolete" scrap such as old sheet, utensils, castings, and forgings. Secondary ingot ceiling prices, as well as quantity differentials on scrap and ingot, remain unchanged.

Priorities Division Revokes Tin and Lead Foil Order

The tin and lead foil order, L-25, has been revoked. Limitations on the use of tin and lead foil are contained in Orders M-43-a and M-38-c, thus making L-25 unnecessary.

Steel Screen Cloth Removed From Price Schedule No. 40

Steel insect screen cloth is removed from the list of products covered by Price Schedule No. 40, Builders' Hardware and Insect Screen Cloth, in an amendment announced by OPA.

Inclusion of this type of insect screen cloth in Schedule No. 40 is no longer necessary, OPA explained, since maximum prices covering all forms of selling, excepting retail, are established in Price Schedule No. 6, Iron and Steel Products, and in Price Schedule No. 49, Resales of Iron and Steel Products.

The amendment leaves in Schedule No. 40 commercial bronze, handdrawn copper, and "koolshade" fabric insect screening. Other minor changes made in today's amendment include an expansion of "door bells" to cover "door bell plates and push buttons" and an elimination from the miscellaneous hardware group of "screw hooks and eyes."

Structural Building Specifications Revised

■ American Institute of Steel Construction, has revised and printed in a new edition two of its important and widely used documents. Its publication on specifications for the design, fabrication and erection of structural steel for buildings, was revised as of July, 1941. Changes were made in materials, loads and stresses, unit stresses, design fabrication, erection and inspection.

The institute's code of standard practice for steel structures other than bridges was revised in August, 1941, changes being made only in that part relating to weights of standard fillet welds. The code also contains the standard contract forms used by members of the industry.

Either document may be had for 10 cents from the office of the institute, 101 Park avenue, New York.

U. S. Steel Operating Officials Discuss Plans

NEW YORK

■ Operating heads of United States Steel Corp. subsidiaries met with chief executives and directors of the corporation here last week to report upon operating results of 1941, and to make plans for meeting increased demands. Production to win the war was the keynote.

More than 60 officials of the parent company and its subsidiaries listened to announcement of all-time records in the mining and transportation of raw materials, in the production and shipment of steel, and many other branches of the corporation's activities.

Benjamin F. Fairless, Corporation president, who presided congratulated subsidiary companies' officials on 1941 results, and expressed confidence in their ability to accomplish whatever may be required this year. The meeting concluded with the forty-first annual dinner of the corporation, in the Waldorf Astoria.

Corporation's Finished Steel Shipments Set Two Records

Finished steel shipments by the United States Steel Corp. in December were 1,846,036 net tons, an increase of 221,850 tons, 13.65 per cent, over 1,624,186 tons in November, and an all-time record for December. The prior December peak was 1,544,623 tons in 1940, which was exceeded by 301,413 tons, or 19 per cent.

Shipments in 1941, before year-end adjustment, totaled 20,458,937 tons, against 15,013,749 tons in 1940, after adjustment, a gain of 5,445,188 tons, 36.26 per cent. This was the largest for any year in the history of the Corporation and was 19.6 per cent greater than the prior record, 17,105,397 tons, in 1916.

(Inter-company shipments not included)
Net Tons

	1941	1940	1939	1938
Jan.	1,682,454	1,145,592	870,866	570,264
Feb.	1,548,451	1,009,256	747,427	522,395
March	1,720,366	931,905	845,108	627,047
April	1,687,674	907,904	771,752	550,551
May	1,745,295	1,084,057	795,689	509,811
June	1,668,637	1,209,684	807,562	524,994
July	1,666,667	1,296,887	745,364	484,611
Aug.	1,753,665	1,455,604	885,636	615,321
Sept.	1,664,227	1,392,838	1,086,683	635,645
Oct.	1,851,279	1,572,408	1,345,855	730,312
Nov.	1,624,186	1,425,352	1,406,205	749,328
Dec.	1,846,036	1,544,623	1,443,969	765,868
Total, by Mos.	20,458,937	14,976,110	11,752,116	7,286,347
Adjustment		†37,639	*44,865	†29,159
Total		15,013,749	11,707,251	7,315,506

†Increase. *Decrease.

REVISIONS AND ADDITIONS TO

PRIORITIES—ALLOCATIONS PRICES

as published in Section Two of STEEL of Jan. 12, 1942

"M" ORDERS

M-18-a: Chromium. Amendment, effective Jan. 13, 1942, prohibits melting of more than 2 tons of ferrochrome in any one month without authorization by Priorities Director.

M-21-d: High Chromium Steel. Filing date of form PD-221—required of all persons, other than warehouses, possessing steel containing 4 per cent or more of chromium—changed to Feb. 1. Order originally required filing by Jan. 15.

M-31 as amended: **Methyl Alcohol,** effective Dec. 31, 1941. Forbids the use of methyl alcohol for manufacture into, or packaging as, an anti-freeze agent.

M-38-c: Lead, effective Jan. 10, 1942. Restricts lead use for certain purposes between Jan. 1 and March 31 to 50 per cent of amount used in either third or fourth quarters of 1941. After April 1 consumption banned entirely. Prohibited uses are: Automobile body solder; ballast or keels for pleasure boats; blocks for cutting leather; building supplies; caskets and casket hardware; foil; ornamental glass; regalia; badges and emblems; statuary and art goods; tennis court markers; toys; and weights for bats, clocks, decoys, dresses, golf clubs, jockey saddles. Exempted are electroplating anodes and cathodes; heat treating baths for steel; bearings, bushings and thrust washers; fire fighting equipment; condenser foil; electrotyping and moulding lead; glass for optical and scientific purposes; arsenate for insecticides and fungicides; solder; X-ray equipment; pigments and driers. Also may be used where called for by safety regulations, government contracts, on ratings of A-1-j or higher, and in manufacturing plants where corrosion makes lead imperative.

M-43 (Amendment): **Tin,** effective Jan. 14, 1942. Original order permitted delivery of 5-ton lots to regular customers monthly without specific authorization by Priorities Director. Amendment reduces this amount to 3 tons, provides that customer cannot receive more than 5 tons monthly from all suppliers and makes customer file certificate of compliance with purchase order.

M-50: Jewel Bearings, issued Jan. 14, 1942. Prohibits sales not specifically authorized by Priorities Director, except for delivery on orders of A-1-j rating or higher. Starting March 1, 1942, jewel bearings subject to complete allocation.

M-51-a: Pigs' and Hogs' Bristles, effective Jan. 7, 1942. Requires all persons having title to bristles to file a report on Form PD-217 with the Bureau of Census by Jan. 15, 1942.

M-52: Sulphite Pulp, effective Jan. 9, 1942. Directs distribution and conserves supply of sulphite wood pulp.

M-54: Molasses, effective Dec. 31, 1941. Restricts monthly deliveries to various types of purchasers up to 50 per cent of monthly average receipts in 12 months ended June 30, 1941. Deliveries for foundry purposes limited to 110 per cent of base period rate.

M-57: Tung Oil, effective Jan. 8, 1942. Sales limited to orders of A-2 or better, with following exceptions' Orders for manufacture of linings for food cans and outside can coatings when essential to withstand normal food processing; orders for uses to comply with safety and health regulations which specifically require tung oil, orders placed by Defense Supplies Corp.

M-63 (Amendment): **Imports of Strategic Materials,** effective Jan. 13, 1942. Adds hides and skins, asbestos originating in Rhodesia or Union of South Africa, rapeseed oil, coconut oil, copra, palm oil and tung oil to imported materials to be handled by Metals Reserve Co. or other authorized government agencies.

M-66: Cashew Nut Shell Oil, effective Jan. 13, 1942. Use limited to defense orders, rated A-2 or better, for brake linings or resins required for insulating aviation ignitions or for impregnating electrical coils.

M-68 (Amendment): **Material for Oil Industry,** effective Jan. 14, 1942. Permits completion of wells in process of drilling at time original order was issued, Dec. 23, 1941. Forbids drilling of wells unless all separate property interests within 4-acre area surrounding drilling operation have been consolidated. M-68-c, effective Jan. 14, 1942, forbids construction of new facilities or improvement of existing ones, including filling stations, for marketing petroleum or its products, except when authorized by Priorities Director. Work started before Jan. 14 and to be completed within 60 days may continue.

M-69: Distilled Spirits, issued Jan. 10, 1942. Requires all distilleries with facilities to make 190 proof ethyl alcohol from corn or grain to use them only in production of that type of alcohol, starting Jan. 15, 1942. Deliveries subject to direction by Director of Priorities.

M-72: Tin and Lead Scrap, effective Jan. 8, 1942. Dealers are forbidden to accept deliveries of scrap unless during the preceding 60 days they have disposed of an amount equal to their inventory on date of delivery. Direct allocation by Director of Priorities provided for, when necessary. Dealers and consumers must report by 10th of each month to Tin and Lead Branch, OPM, detailing inventory, production, purchases, sales and consumption for preceding month.

"P" ORDERS

P-40 extension: **Industrial Lift Trucks,** issued Jan. 10, 1942. Extended until March 10, 1942.

P-55 (Amendment).: **Defense Housing Projects,** effective Jan. 12, 1942. Provides that manufacturers of building materials to whom rating is extended should apply for assistance under P-90 on PD-25A. Rating may be extended by builder to supplier, provided latter is not manufacturer.

P-98: Petroleum Industry Materials, effective Jan. 14, 1942. Assigns following material ratings: A-1-e for geological searching for unknown pools; A-2 for research laboratory work; A-2 for searching for unknown pools by exploratory wells; A-8 for maintenance, repair or operating supplies; A-1-a for repairs of actual breakdown; A-1-c to avert breakdown; A-2 for certain chemicals and other materials used in refining; A-2 in making alterations; A-2 for repairs of actual breakdown of transportation equipment.

"L" ORDERS

L-1-c, L-2-f, L-3-e, Extensions: **Sales of 1942 model passenger automobiles, trucks and truck trailers** banned until Feb. 2. Original ban issued Jan. 1 expired Jan. 15. Rationing plan to dispose of new units after Feb. 2.

L-20. (Amended) **Cellophane and similar Transparent Materials derived from Cellulose,** effective Jan. 10, 1942. Extends ban on use of these materials to fountain pens, pencils, leads; jewelry, clocks, watches, cameras; wood and its prducts; leather and its products; brushes, combs (except tooth brushes); bottled beverages; bottled foods; canned goods; flowers; cleaning material; cigar and candy boxes; bowl and garment covers; household dyes; sewing supplies; toys and games; coat hangers; cake decorations; sponges; powder puffs; hair nets; doilies; hair waving equipment; brake linings; moldings; paints; molding clay and clay products; cigarettes (unless foil is omitted); plastic products. Does not apply to stocks in user's hands Jan. 8, 1942.

L-25 (Revoked): **Tin Foil and Lead Foil,** effective Jan. 15, 1942. Restrictions on foil use now covered by M-43-a and M-38-a.

"E" ORDERS

E-1-a: Machine Tools, effective Jan. 15, 1942, revoking Supplementary Order No. 1 to Order E-1. Sets up new Master Numerical Preference List, containing names of contractors (urgency standing) who are to receive preference in

tool delivery. Guides tool makers in delivery schedules when preference ratings are alike. List not made public.

MISCELLANEOUS ORDERS

Priorities Regulation No. 3, issued Jan. 12, 1942, effective Feb. 2, 1942. Beginning on latter date new forms PD-1A and PD-3A replace PD-1 to PD-5 inclusive for assignment of individual ratings. Use optional until March 1, mandatory thereafter. PD-1A used to make specific applications for materials not provided for by general preference orders. Ratings are assigned on form itself when approved by Priorities Division. PD-2 will not be replaced. Ratings under PD-1A may be extended. PD-3A, used for ratings for government orders, replaces PD-3, PD-4, PD-5, and ratings may be extended. Ratings may not be used to obtain capital goods, but may be used to replace inventories consumed in filling rated orders.

PRICE SCHEDULES

No. 2—Secondary aluminum and scrap, effective March 24, 1941; amended June 3, Aug. 14 and Nov. 1, 1941; correction May 5, 1941. Amended, effective Jan. 13, 1942, covering segregated plant scrap.

Secondary ingot, cents per lb. lots of 30,000 lbs. or more, f.o.b. shipping point: 98 per cent pure and silicon alloys 15.00, No. 12 and piston alloys 14.50, deoxidizer 13.50. Add ¼-cent for 10,000-30,000 lbs.; ½-cent 1000-10,000 lbs.; 1 cent under 1000 lbs.

Scrap, in cents per lb., f.o.b. point of shipment, for lots of less than 1000 lbs., 1000-20,000 lbs. and 20,000 lbs. or over, respectively: Plant Scrap—segregated 2S clips or other 2S solids 10.00, 11.00, 11.50; mixed clips or other mixed solids, 8.50, 9.50, 10.00; segregated borings and turnings, 7.50, 8.50, 9.00; mixed borings and turnings, 6.50, 7.50, 8.00. Obsolete Scrap—pure cable, 10.00, 11.00, 11.50; old sheet and utensils, 9.50, 10.50, 11.00; old castings and forgings, 10.00, 10.50, 11.00; pistons free of struts, 10.00, 10.50, 11.00; deduct 2 cents for pistons with struts.

No. 15—(Amended)—**Copper,** effective Feb. 1, 1941. Base prices on electrolytic lake and fire-refined, casting copper excepted, remain at 12.00c, Connecticut, but premium for less-carlots reduced from ½-cent to ⅛-cent. Casting copper price remains at 11.75c, refinery, but premium for less than 20,000 pounds reduced from ½-cent to ¼-cent.

No. 40 (Amendment)—**Builders hardware,** effective Jan. 16. Removes steel insect screen cloth from list of products covered, since this material regulated by Price Schedules No. 6 and No. 49. Also eliminates screw hooks and eyes from miscellaneous hardware group.

No. 43 (Amendment) **Used steel barrels or drums,** effective Jan. 8, 1942. Schedule amended to place maximum prices for "raw" used steel barrels or drums sold by the emptier at $1.25 to any person. Formerly this ceiling applied when such drums were sold directly to users. Prices for sizes other than 50-55 gal. based on 80 per cent of "Oct. 1, 1941" prices of new units when reconditioned, 65 cents less when not cleaned.

No. 66—Retreaded, Recapped tires, effective Jan. 19, 1942. Establishes maximums for retreading, full capping, or top capping with different grades of camelback and varying tread depth. For example, 6.00 x 16 passenger tire is $7.50 for tread depth 12/32-inch or more, $7 for tread depth $\frac{5}{16}$ to 11/32, $6.50 for depth less than $\frac{5}{16}$, when using camelback market price of which is 26 cents per pound or over. These prices 55 cents less for camelback 21 to 26 cents. Add $1.50 when tire carcass is furnished by seller.

No. 68—Hide Glue Stock, Effective Jan. 20, 1942.

No. 69—Primary Lead, effective Jan. 15, 1942. Maximum in cents per pound in carloads delivered St. Louis: Pigs—Common lead 6.35; corroding lead 6.45; chemical lead 6.45; copperized lead 6.40 when made from common lead, 6.50 when made from corroding lead. Ingots or Special Shapes—½-cent higher for each grade. New York prices 15 points above St. Louis; Chicago district 5 points; Detroit, Philadelphia, Cleveland-Akron 15; Pittsburgh, Connecticut, Boston, Springfield, Worcester 20.

No. 70—Scrap and secondary lead, effective Jan. 15, 1942. Maximum scrap prices f.o.b. point of shipment are determined by deducting from the maximum prices for common lead at various basing points the following: .55c for soft, hard and cable lead scrap and .65c for battery lugs and lead content of lead covered copper cable. Maximum secondary prices f.o.b. point of shipment, carlots, determined by applying following differentials to basing points for common primary pig lead: Low grade pig (minus 99.73%) deduct .15c; low grade ingots, linked ingots, other special shapes add .10c; high grade (99.73% plus), base price; high grade ingots, linked ingots, other special shapes, add .50c.

Changes in District Headquarters

PHILADELPHIA

■ District headquarters of OEM, OPM and OPA have been moved from the Federal Reserve Bank to the Broad Street Station building where they will occupy the entire sixth floor and a portion of the fifth. The OCD will also maintain one of its offices in this building.

In all 27,000 square feet are being occupied on the sixth floor and 10,000 square feet on the fifth, with OPA negotiating for an additional 10,000 square feet.

The OPM Labor Division will continue in the Widener building and the Office of Defense Transportation in the Gimbel building, both located in Chestnut street.

Roger C. Butts is regional administrator officer in OEM and Howard Browning, regional information officer.

Orville H. Bullett, state director of the Division of Contract Distribution, will have headquarters in the new offices, and associated with him will be Thomas Evans, deputy state administrator, L. C. Murdock, deputy state director, in charge of field operation, and A. W. Byron, chief engineer.

F. W. Slack is district manager of the Priorities Division of OPM; John M. Leonard, assistant district manager; and J. C. Pierie, assistant to the district manager.

Approximately 6000 square feet of floor space is being devoted to an exhibit of parts, which prime contractors in the district would like to have manufactured by sub-contractors.

Detroit OPM Offices Move Into Boulevard Building

Detroit OPM offices of the Division of Contract Distribution, Division of Priorities and Training Within Industry Branch have been moved from 160 West Fort street to the Boulevard building, 7310 Woodward avenue at Grand boulevard, telephone TRinity 1-5500. Exhibit of parts for production by prospective prime contractors is now in permanent quarters on the eighth floor of the same building, and interested representatives are urged to visit the display.

OPM Appointments

John J. Hall, Pittsburgh, vice president of the American Radiator & Standard Sanitary Corp., has been appointed assistant to the deputy director of priorities.

F. M. Folsom, Chicago, executive vice president and general manager of Goldblatt Bros., has been appointed deputy director of the OPM Division of Purchases.

Corwin Wickersham, Greenwich, Conn., formerly with the Priorities Division, has been named chief of the foreign requirements section in the Purchases Division.

Steel Jobbers May Obtain Tires for Some Purposes

Leon Henderson, director of civilian supply, last week ruled warehouses may obtain tires for trucks used to distribute semifinished steel from warehouse to steel processors.

Machine Tool Rebuilding Order Extended to April 1

Preference Rating Order P-77 giving A-1-c rating to deliveries of specified materials used in rebuilding machine tools, has been extended to April 1.

Copies of STEEL's Guide Available

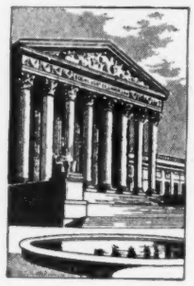
Additional copies of STEEL'S section on Priorities, Allocations, Prices, published January 12 are available to regular subscribers.

STEEL also has available at nominal prices many of the "PD" Forms which may be reproduced. These are listed on page 10 of the Priorities, Allocations, Prices Section.

Address inquiries to STEEL, Penton Building, 1213 West Third Street, Cleveland, Ohio.

Windows of WASHINGTON

Priority assistance under Production Requirements Plan offered manufacturers of defense housing materials . . . New master numerical preference list for machine tool deliveries issued . . . New restrictions imposed on use of lead. Maximum base price raised to 6.50 cents a pound . . . Premiums to be paid for increased nonferrous metals output to stimulate production . . . Deliveries of tin to small users limited



By L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ MANUFACTURERS supplying building materials for defense housing projects should hereafter apply for priority assistance under the recently announced Production Requirements Plan.

This change in the procedure on defense housing projects is provided for in connection with an amendment to Preference Rating Order P-55.

Under the former procedure, manufacturers of building materials could extend project ratings to speed up their own purchase orders for necessary materials. Under the new procedure, however, these manufacturers may not extend the rating assigned to the project, but will apply on form PD-25a for assistance under the Production Requirements Plan.

When a rating has been applied to a housing project, that rating may be extended by a builder to a supplier if the supplier has "not in whole or in part manufactured, produced, assembled or otherwise physically changed" the materials to fill a rated order. The rating carried by the project may then be applied by the supplier to his own purchase orders for finished items. But when the rating has been extended to a manufacturer, the manufacturer should apply for assistance under Production Requirement Plan, and is not to extend the project rating directly.

Other requirements of the amendment are: (1) That suppliers sign an acceptance of Preference Rating Order P-55 amended, before applying its rating to their orders; (2) that each extension of the order is authenticated by an authorized agent of the federal housing administrator.

The amendment authorizes a supplier to defer application of the ratings assigned to orders filled by him, until he can place a purchase order with a manufacturer for the minimum quantity procurable on customary terms.

Restrictions on Deliveries of Tin to Small Users Tightened

Tighter restriction on deliveries of tin to small users is contained in an amendment to the tin order, M-43.

Original order permitted the delivery of 5-ton lots to regular customers monthly without specific authorization by the director of priorities. The amendment cuts this amount to 3-ton lots, provides that the customer cannot receive more than 5 tons per month from all suppliers, and makes the customer file with his purchase order a certificate of compliance.

The amendment also re-defines the term "distributor" to include tin warehousemen and jobbers.

Lift Truck Priority Order Extended to March 10

Preference Rating Order P-40, making available an A-1-g rating for materials going into the manufacture of industrial lift trucks and replacement parts, was extended today until March 10 by an order issued by Acting Director of Priorities J. S. Knowlson.

The high rating which would have expired Jan. 10, is designed to assure continuation of the building program for industrial lift trucks, which are widely used in lifting, hauling and moving war materials.

Petroleum Industry Aided by New Preference Rating Order

Priority assistance has been extended to all branches of the petroleum industry by Preference Rating Order P-98.

The order assigns priority rating from A-1-a to A-10 for deliveries of materials to be used for specified purposes in the production, refining, transportation and marketing of petroleum and petroleum products. Ratings are also assigned for the production and certain types of transportation of natural gas.

At the same time, the construction of new facilities or improvement of existing facilities, including filling stations, for the marketing of petroleum or petroleum products is forbidden by Conservation Order M-68-c, except when specific permission is granted by the director of priorities. However, construction or improvement which was begun before the effective date of the order and which will be completed within 60 days may be carried out. Otherwise exceptions will be made only when the director of priorities finds that new construction or improvement is necessary to promote the war effort.

New Order Governs Machine Tool, Gage Distribution

New order covering production and distribution of machine tools, gages and chucks has been issued by the Priorities Division.

The order, General Preference Order No. E-1-a, revised, became effective Jan. 15, and replaces Supplementary Order No. 1 to General Preference Order E-1, which has covered machine tool deliveries. The new order was originally issued Jan. 6 to become effective Jan. 10, but was suspended pending revision.

The new order contains only minor changes in substance from the previous orders, but is accompanied by a new master numerical preference list which will take effect 30 and 60 days after Jan. 15, depending upon the type of machinery involved. This list is restricted and will not be made public, but copies will be sent to all manufacturers of machine tools, gages and chucks, together with a copy

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of the new order and an explanatory letter.

The master numerical preference list contains the names of contractors who are to receive preference in the delivery of machine tools when there is a conflict of delivery dates between orders with the same preference rating, and it indicates the relative urgency standing of those who are on the list. By referring to this list, machine tool, chuck and gagemakers can determine how to schedule deliveries to fill the orders on their books when they are unable to meet all delivery dates in accordance with preference ratings.

Gages and chucks will be brought under the same complete priority control as machine tools by the terms of General Preference Order E-1-a, revised.

The revised master preference list will make changes in the urgency standing of machine tool requirements of war contractors in accordance with new circumstances and the needs of the war program.

Sweeping Restrictions Imposed on Use of Lead

Sweeping restrictions on the use of lead are ordered in Conservation Order M-38-c.

The order follows the pattern of the copper and tin conservation orders, prohibiting the use of lead in a list of civilian manufactures and curtailing the amount to be used in more essential ones.

At the same time, an amendment was issued to the general imports order, M-63, adding lead to the list of materials that cannot be imported except by the Metals Reserve Co., RFC subsidiary.

The lead order provides that after April 1, the metal cannot be used in the manufacture of automobile body solder, as ballast or keels for pleasure boats, as blocks for cutting leather, in building supplies, in caskets and casket hardware, in foil, ornamental glass, regalia, badges and emblems, statuary and art goods, tennis court markers, toys, and as weights for bats, clocks, decoys, dresses, golf clubs and jockey saddles.

From Jan. 1 to March 31 users of lead for these items must be restricted to 50 per cent of the amount used in either the third or fourth quarters of 1941.

Most other users of lead are restricted, by quarters, to 90 per cent of the amount used in either the third or fourth quarters of 1941.

No restriction is placed upon the use of lead in military contracts, or for certain other government agencies; where it is called for in underwriter or safety regulations, on preference ratings of A-1-j or higher; for use in manufacturing plants where corrosion makes lead imperative; in scientific and industrial laboratories and hospitals where chemical action would make its use necessary; or in the items on List "B" attached to the order.

These items are anodes and cathodes in electroplating processes, baths for heat treatment of steel, bearings, bushings and thrust washers, fire fighting equipment, foil for condensers, electrotyping and molding lead, glass for optical and scientific purposes, arsenate for insecticides and fungicides, solder, X-ray equipment and pigments and driers.

Reason for the order is the increasing demand for lead caused by greater military and naval needs.

The order is to continue in effect until revoked.

Lead Price Ceiling Raised To 6.50 Cents, New York

Base maximum price of 6.50 cents a pound, f.o.b., New York, has been established for common primary lead in a formal ceiling schedule issued by OPA.

Common primary lead has been selling since late March, 1941, at 5.85 cents a pound, New York, under informal understandings between OPA and leading producers. The higher price, now set as a formal ceiling, is one phase of the government's program to stimulate production of every pound obtainable of this essential base metal in view of the tremendous demands generated by the war effort.

Simultaneously, OPA announced a schedule of ceiling prices for lead scrap materials, "secondary" lead including calking lead; battery lead scrap; and antimonial lead, both primary and secondary. The maximum price for all of these are keyed directly to the newly established price of 6.50 cents a pound for common primary lead.

The primary lead price schedule takes into consideration the customary differentials between the four grades: common, corroding, chemical and copperized lead, by fixing a maximum differential for corroding and chemical lead at ten points above common lead and a maximum premium of five points for copperized lead above the price of the grade from which it is produced. (A "point" is one-one-hundredth of a cent.)

Manufacturers of metallic lead products and lead pigments have been asked not to make any sales at prices above those in effect as of Jan. 2.

Three Exceptions Allowed in Copper Price Ceiling

Permission to buy for chemical use limited amounts of specially prepared copper scrap at a price higher than the established ceiling has been granted to three chemical producers by the OPA.

The premium price approved is 11¼ cents a pound, f.o.b., shipping point, which compares with the ordinary ceiling of 10 or 10½ cents a pound, depending on the quantity purchased. Respective monthly requirements of the three chemical concerns are 50 tons, 120 tons, and 125 tons and their purchases at higher-than-ceiling prices are limited to these amounts.

In order to meet rigid manufacturing requirements, one chemical company buys 6-18 gage copper wire and another 8-16 gage copper wire; in both cases free from solder, insulation, lacquer, ash, tin, lead, iron and other foreign substances. The wire must be packed in loose bales or coils. The third manufacturer's specifications call for wire of not less than 98 per cent copper content, of which 80 per cent must be 10-gage or smaller. This wire must be reasonably free from tin and must be packed in loose bales, boxes or barrels.

Premiums To Be Paid for Extra Nonferrous Metals Output

Metals Reserve Co. has agreed to stimulate production of zinc, lead and copper by paying higher prices for those metals produced in excess of 1941 output. Details of the plan and quotas for individual producers will be announced by the Price Administrator Henderson.

Jesse Jones, federal loan administrator, said in a letter to OPM Director Knudsen and Henderson:

"You are advised that, in accordance with your suggestion, Metals Reserve Co. will, at your request, for a period of 2½ years from Feb. 1, 1942, pay 11 cents per pound, East St. Louis, for zinc, 9¼ cents per pound, New York, for lead, and 17 cents per pound, Connecticut Valley, for copper, for increases above 1941 production, governed by quotas to be fixed by you with our approval.

"This price will apply also to mines which were not operated at all in 1941, and to new mines, but will not apply to production already aranged for by specific agreement. Consideration will be given to a longer purchase agreement than 2½ years where the expansion of facilities is necessary.

"Any metals so acquired by the Metals Reserve Co. which are not used for or by the government will be subject to your allocation at the ceiling price fixed by the administrator. By this procedure we should get maximum production of these critical and strategic metals for war purposes without raising the price to consumer."

Extension of Ratings Simplified By Priorities Regulation No. 3

WASHINGTON

■ ASSIGNMENT and extension of individual preference ratings has been simplified and made more uniform by Priorities Regulation No. 3, issued Jan. 12.

Beginning Feb. 2, individual preference ratings of the type which have heretofore been assigned on PD-1 and PD-3 forms may be extended to suppliers and subsuppliers of the producer who receives the rating by a simple endorsement on purchase orders, like that now used for extension of limited blanket ratings and ratings under the Production Requirements Plan.

Under an arrangement between the director of priorities and the Army and Navy Munitions Board, ratings assigned by Army and Navy field officers will no longer be limited to items appearing on the Army and Navy priorities critical list. However, under Regulation No. 3, extension of individual ratings will be limited to material which will be physically incorporated in the items originally rated.

Two new forms of Preference Rating Certificates, PD-1A and PD-3A, will replace the present forms, PD-1 to PD-5 inclusive, for assignment of individual ratings. Use of the new forms will be optional on and after Feb. 2 and mandatory on and after March 1.

Form PD-1A which will replace Form PD-1 is a simplified blank to be used in making specific applications for materials or supplies when general preference orders do not provide the required priority assistance. When PD-1A applications are approved by the Priorities Division, ratings will be assigned on the form itself. A similar procedure has been standard for some months. Form PD-2, which was formerly used to assign ratings in response to applications on PD-1 forms, will disappear and will not be replaced.

May Be Extended to Suppliers

Preference ratings assigned to applicants who use Form PD-1A may be extended on and after Feb. 2 to suppliers and subsuppliers of the applicant by the prescribed endorsement on purchase orders, signed by a duly authorized representative of the company making the extension, and will not require a countersignature from any government officer. Heretofore, preference ratings assigned on PD-1 forms have not been extendable under any circumstances.

Form PD-3A will be used for all applications for ratings in connection with orders from the Army, Navy, Coast Guard, Maritime Commission, Coast and Geodetic Survey, Panama Canal, National Advisory Committee on Aeronautics, Civil Aeronautics Authority, Office of Scientific Research and Development, Procurement Division of the Department of the Treasury, Surplus Marketing Administration of the Department of Agriculture, and contracts or purchase orders from foreign governments. It will replace Forms PD-3, PD-4, and PD-5.

Ratings assigned on Form PD-3A may also be extended to suppliers and subsuppliers without countersignature. Ratings which have been assigned on PD-3 forms were formerly extendable without countersignature only if the amount of the order involved was less than $500.

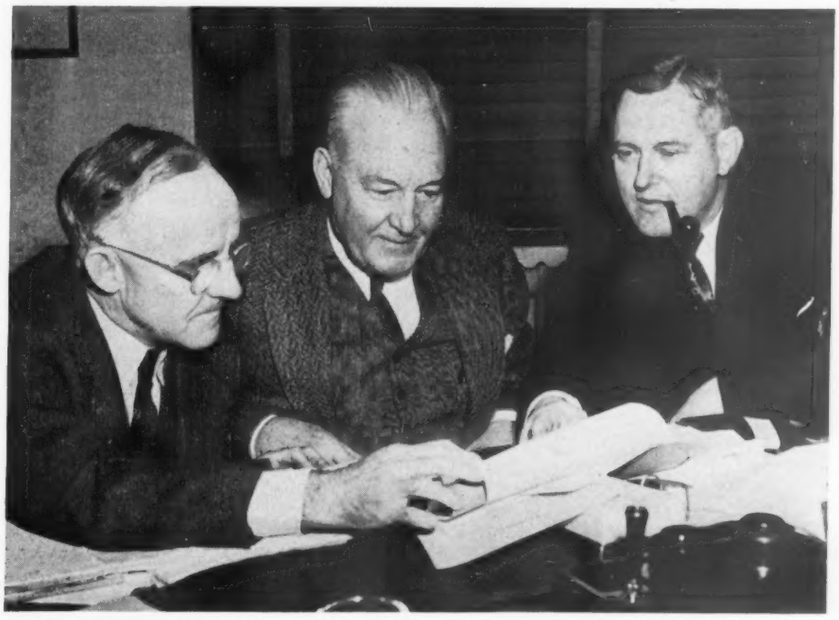
When an individually rated order is served upon a supplier by the original applicant under the new procedure, the rating may be extended by the supplier, by his suppliers and subsuppliers to obtain any material which will be delivered to the original applicant in accordance with the rating, but neither the applicant, his suppliers or subsuppliers may use the rating to obtain machinery or capital equipment which they use in fabricating parts to fill the order. If producers who have been assigned a rating on a PD-1A form need machinery or capital equipment for this purpose which they cannot obtain without priority assistance, they must apply for a separate preference rating on another PD-1A form. Prime contractors who need machinery or equipment to be used exclusively in filling Army or Navy orders may be given a rating for use in obtaining such machinery or equipment on PD-3A forms.

May Replace Inventories

Another important change made by Priorities Regulation No. 3 allows the recipient of an individual rating, his suppliers and subsuppliers to employ the rating for replacement in inventory of materials used in filling the rated order, provided such replacement does not increase inventories above a praticable working minimum.

If the materials to be replaced are in whole or in part manufactured, processed, assembled or otherwise physically changed by the supplier, the rating must be extended while the materials are in process of fabrication. For materials which are not processed or otherwise changed by the supplier, extension of the rating may be deferred up to three months, until an order can be placed for the minimum quantity procurable on

Maritime War Emergency Board Organized



■ **Appointed by the President to handle maritime labor disputes, war risk insurance problems, and to define war areas, the Maritime War Emergency Board is shown in one of its first meetings. Left to right, Frank P. Graham, president, University of North Carolina; Capt. Edward Macauley, Maritime Commission, chairman, and John R. Steelman, Department of Labor. NEA photo**

customary terms. This provision is primarily for the benefit of wholesalers and distributors, enabling them to group their own orders while making deliveries in small quantities.

The new regulation also allows a supplier or subsupplier who has received two or more purchase orders bearing ratings of the same grade to include in a single purchase order or "basket," within the limitations which have been indicated above, any or all of the material which he requires to make deliveries in accordance with the rated purchase orders which have been served upon him. In such case, he must specify in the certification on his own purchase order all of the preference rating certificate form numbers and serial numbers referring to the orders in connection with which he is extending the ratings.

All persons who receive or extend preference ratings assigned on PD-1A and PD-3A forms must keep records as prescribed by Priorities Regulation No. 1 and make such reports as may be required by the director of priorities. Use of PD-3A forms may also be subject to such further requirements as may be set forth by the Army and Navy Munitions Board with the concurrence of the director of priorities.

Preference Rating Certificate Form PD-1A may be reproduced in blank by or for any user, but Preference Rating Certificate Form PD-3A may not be reproduced. PD-1A forms may be procured from the OPM Priorities Division, either in Washington or in field offices. PD-3A forms may be procured from contracting and procurement officers of the Army and Navy.

Copies of the new forms will not be distributed to applicants by OPM or the Army or Navy until immediately before Feb. 2.

Measuring Instrument Makers Withdraw Price Increases

Four manufacturers of mechanical measuring instruments, in response to a request made to all plants in that industry by the OPA, have withdrawn price increases previously in effect and canceled increases proposed for January.

Companies involved and the products affected are:

American Meter Co., New York, proposed increase in tin plate gas meters.

Crosby Steam Gage & Valve Co., Boston, increase on gages and accessories, effective Oct. 20, 1941.

Mason-Neilan Regulator Co., Boston, increase on instruments, effective Aug. 22 last.

The Mercoid Corp., Chicago, proposed increase on thermostats and other control devices.

In a letter to firms in the industry, OPA pointed out that advances in price of measuring instruments, indicating and control devices are a matter of concern to a wide sector of the national economy. It asked that no prices for this type of equipment be above the levels effective on July 29.

MEETINGS

Scrap Institute Convention Scheduled for Week-End

■ ANNUAL convention of the Institute of Scrap Iron and Steel Inc., originally scheduled for Jan. 6-8 in Chicago, has been re-scheduled for Feb. 21-22, Hotel Sherman, Chicago. The new dates cover a week-end, thus minimizing time dealers must take away from their business.

Foundrymen Eliminate Preview Day To Conserve Time

Executive committee of the American Foundrymen's Association has decided to eliminate this year the Preview Day custom for its show, inaugurated when industry generally was working a 5-day week. Instead, exhibits will remain open until 10 p.m. on the final day. The calendar now provides for the forty-sixth annual convention of the First Western Hemisphere Foundry Congress and Allied Industries Show, Cleveland Public Auditorium, Cleveland, April 20-24.

Will Discuss Wartime Problems of Personnel

Industrial relations and personnel executives will discuss problems of wartime production at the National Personnel Conference of the American Management Association, Hotel Stevens, Chicago, Feb. 4-6. Among the speakers are R. J. Greenly, chief, training division, Carnegie-Illinois Steel Corp., Pittsburgh, and Wallace George, personnel director, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.

Convention Calendar

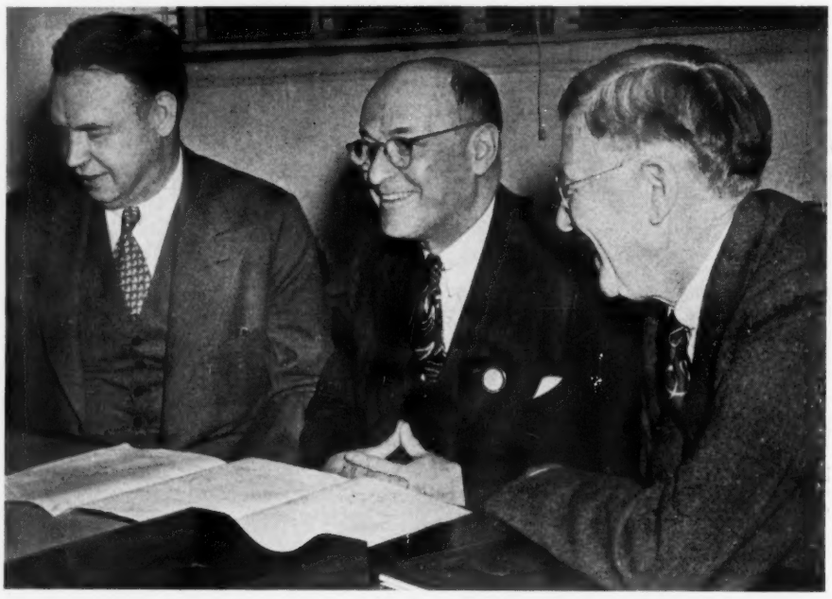
Jan. 26-28—National Warm Air Heating and Air Conditioning Association. Annual convention, Benjamin Franklin hotel, Philadelphia. William Boeddener, 145 Public square, Cleveland, is secretary.

Jan. 26-29—American Society of Heating and Ventilating Engineers. Annual meeting, Bellevue-Stratford hotel, Philadelphia. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

Jan. 26-30—American Institute of Electrical Engineers. Winter convention to be held at Engineering Societies building, 33 W. 39th street, New York. H. H. Henline, of this address, is national secretary.

Jan. 26-30—National Canners' Association. Annual meeting, Stevens hotel, Chicago. F. E. Gorrell, 1739 H street, Washington, is secretary.

Girdler Takes Over at Consolidated Aircraft



■ T. M. Girdler, (center) board chairman and chief executive officer, Consolidated Aircraft Corp., last week flew to San Diego, Calif., and immediately went into conference with Harry Woodhead, (left) Consolidated president, and H. D. Wilson, board member. Conference subject: How to step up production of bombers. NEA photo

Raw Materials To Limit Alloy Steel Output; Specifications to Change

DETROIT

■ TWO significant facts with regard to the outlook for alloy steels were cited by E. C. Smith, chief metallurgist, Republic Steel Corp., Cleveland, in his address before the Society of Automotive Engineers at its annual meeting here last week. They are:

1. The limit of production of alloy steels depends upon raw materials available. Temporarily there may be limits in the volume of electric furnace steels available, and other tight spots are known, but by and large industry can consume more alloy than can be provided.

2. Usual habits of specifying customary compositions are not feasible. We must produce from what we have. From time to time, shifts as profound as those which we went through in the last 12 months will turn up and it is to be hoped that there no longer will be any attempt to hide the gravity of the situation by concealing the amount of products available with the hope that embarrassment may not turn up.

57.4 Per Cent for Defense

Mr. Smith suggested that wider application of hardenability tests would encourage less adherence to specific ranges of chemistry and encourage the use of steels containing about 0.60 per cent nickel, 0.50 per cent chromium, 0.20 per cent molybdenum and 0.25 per cent copper. These steels, with vanadium or the Grainal family of hardening alloys, are completely useful in all the places where the usual structural alloy steel is required, and he forecast that coming months would see wide adoption of the manganese-molybdenum and the manganese-nickel-molybdenum-chromium steels, with 0.30 per cent silicon in products where higher alloys have been used hitherto.

Newest designation of steels is the NESS (national emergency steel specifications) series of identification numbers. For example, the NESS 4000 series is 1.00 per cent manganese and 0.25 per cent molybdenum; the NESS 4300 series (corresponding to the newly proposed S.A.E. 8000 series) contains 0.85 manganese, 0.55 nickel, 0.25 molybdenum and 0.55 chromium. Physicals of these two series of steels are comparable to the S.A.E. 3100 and 4100 series, and carbon contents should approximate those specified in the 3100 and 4100 series.

Mr. Smith presented some interesting statistical information showing how much present steel production is going into defense. The following figures show the trend:

	Per cent defense orders of total
Forgings, armor plate and ordnance	100.0
Forgings, all other	93.1
Steel castings	91.4
Wheels and axles	91.2
Plates (universal and sheared)	81.7
Concrete bars	79.0
Tool steel bars	78.3
Tie plates, spikes, track accessories	78.1
Structural shapes and piling	74.0
Cold finished (carbon and alloy)	71.2
Rails over 60-pound	67.1
Rails, all others	70.4
Hot rolled alloy bars	68.8
Ingots, blooms, billets, slabs tube rounds, sheet and tin bar	68.1
Hot rolled carbon bars, including hoops and bands	55.6
Sheet, galvanized	52.0
Sheet and strip hot rolled	25.5
Sheet and strip cold rolled	18.4
Sheet, all other	24.8
Pipe and tubing	41.6
Wire and wire products including fence posts	41.3
Skelp	40.5
Wire rods	28.1
Tin and terne plate	10.6
Black plate	4.2
All other	72.1
Industry as a whole	57.4

These figures indicate we are now utilizing some 50,000,000 net tons of ingots annually in the war effort. The current distribution of alloy steels, other than tool steels, is about as follows:

	Per cent
Army and Navy	25
Assigned defense priorities	20
Warehouse	10
Lend-lease	10
Civilian allocation	6
Other export	2
All other	27

Less than 500,000 tons of ingots per month is involved in the foregoing breakdown. To make this steel, it is necessary to draw almost entirely upon material from outside the country.

The most vital alloy is manganese. True, the volume of alloy steel made from manganese alone is not important, but steel is more than the essential alloy of iron and carbon cast in an initially malleable mass. Manganese must be added in quantity. Today the steel industry uses 13 pounds of metallic manganese for each ton of ingots. Soft steels of the simpler types, such as wire, plate and sheet, use about 9 pounds per ton while the usual alloy steel has 19 pounds per ton. Where steel is to be heat treated it is axiomatic that ample manganese be present.

We will import ore for more than 90 per cent of our manganese this year. Our visible supply of ore on hand is about 2,000,000 tons, or less than two years supply. The Western Hemisphere (Cuba, Brazil and Chile) can supply half our needs, provided it can be shipped in. We need hardly expect allocation of manganese, but we can surely expect reduced amounts in every steel in which it is not essential. With defense steels requiring more manganese than usual, the amount per ton of ingots is not dropping in spite of careful plans on the part of producers to save where possible.

The bright spot in the alloy picture is molybdenum. This material was developed as an important alloy by the Germans during the last war and our automotive industry in this country made it possible to build up an impressive production here. It is mined directly or produced as a by-product of copper mining. This year we will produce 50,000,000 pounds, but could use 60,000,000; next year we will have more. For a period of months during the latter part of this year molybdenum will be scarce, but should be available for all reasonable demands and completely available for defense requirements.

Warned of Alloy Shortages

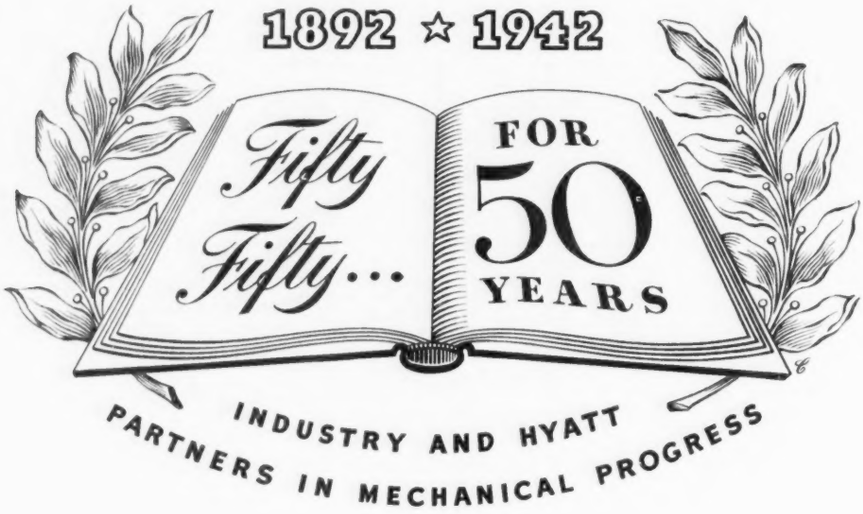
In 1938 and 1939, Mr. Smith pointed out, the chromium-nickel steels made in the open hearth were in greatest demand and the most widely used. In 1940, nickel-molybdenum steels made in open hearths had taken first place. At the same time, the increase in electric furnace production from slightly more than a million and a quarter net tons in 1940 to nearly three and a quarter million tons at the end of 1941, indicates an enormous increase in those highly alloyed steels.

About a year ago, or late in 1940, some of the steel producers raised the question of possible alloy shortages. As is so often the case, little heed was paid to this warning. Not only was there little attention given, but the action of the steel producers was not received with especially good grace by either alloy producers or consumers.

The alloy producers said that the steel producers were becoming hysterical and that consumers felt that a "squeeze play" was being worked which would be detrimental to certain individual customers.

Though there was some element of truth in the claims of both alloy producers and customers, Mr. Smith concluded, the alloy producers now realize only too well that the steel industry just didn't cry loud enough or long enough. On the other hand, the consumers have learned that necessity is the mother of invention and have shifted with unusual rapidity from their normal specifications to others which are available.

THANKS, INDUSTRY!



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Inventive genius and engineering talent have guided us through the years . . . the experiences of one have helped and improved the other. Many design problems have been solved. Many application handicaps have been overcome. We've shown each other many new, better ways of doing things.

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HYATT

QUIET ROLLER BEARINGS

Mirrors of *MOTORDOM*

Automobile engineers, in Detroit for annual meeting, find industry engrossed in speeding up and spreading war production. Idle machine tools and tool shops in motor industry will be listed for use by other arms producers . . . General Motors hopes to have employment back to peak level by end of year . . . Contracts pouring out of Washington now . . . Iron foundries, press plants and assembly plants face suspension

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ CONVERGING on this city several thousand strong last week the Society of Automotive Engineers considered another interpretation of the A in S.A.E. For several years this initial has had the connotation of "Aeronautical" as well as "Automotive"; now it is gaining broader recognition in the field of "Armament."

Highlights among the 35 addresses presented at morning, afternoon and evening sessions of the society's annual meeting were F. M. Zeder's expostulations grouped under the sober title "The Effect of National Defense Development Work on Future Automotive Engineering"; E. S. Chapman's discussion of plant conversion problems, E. C. Smith's hard-hitting analysis of the outlook in alloy steels (see p. 37), and several papers on airplane and airplane engine design and manufacture.

If the visiting engineers could have gone behind the scenes in Detroit they would have seen in process one of the most colossal jobs of organization for "a new model" ever attempted. They were told briefly by Alvan Macauley, head of the industry's war production council, of how the industry is moving into full-scale war equipment output, and of the first three steps taken by the council:

1. Immediate creation of a used machinery listing service which will make available to all industry detailed data on all machine tools not earmarked for military production by the automotive companies which now own them.

2. A pledge, individually adopted by auto companies, making their own tool shops and tooling facilities available, whenever not needed for their own war work, to produce tools for military production of other companies.

3. A request that each auto company appoint a special representative equipped to deal with both the placing and taking of armament subcontracts, who will co-operate with the local office of the OPM's contract distribution service. (In this connection it might be mentioned that space already has been reserved for Ford Motor Co. in the enlarged parts display now being organized by this OPM agency branch here.)

The industry will develop a standardized system of identification, listing not only the general types of machines, but also their age, model and condition. Office space for the service has been assigned in the New Center building and William J. Cronin will organize the work. Machine tool lists not only will be on file here in Detroit but also will be turned over to the OPM and the military services.

Behind the scenes, the engineers might also have been privileged to see some of the myriad charts and tabulations relating to new war activity of General Motors Corp., for example, which expects to shoulder something like 10 per cent of the fifty billion dollar war program before it is through, and which expects by the end of this year to have sufficient production under way to boost employment figures back to the peak level of June, 1941, when the payrolls listed 303,483 hourly and salaried employes.

Next month GM employment appears destined to drop to a low point of something under 100,000 but additions to personnel in war equipment plants will be made at a rate of better than 7000 a month on the basis of the present outlook. New war orders will speed up the rehiring rate as the year moves on. A critical problem at the moment in this rehiring of men is how to reconcile the five-day week with seven-day continuous operation of machines. As C. E. Wilson, GM president, stated at a recent press conference, "We have a law with the 40-hour week, five days of eight hours as standard. Now, we find ourselves in a situation where we want to run our machinery all the time. How do you reconcile those two things? You don't want to work all the men all the time, so we have some practical problems to work out."

Now in process of arbitration with the UAW-CIO is a method of adapting the 168-hour week or "swing shift" operations in GM plants.

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Unfilled Orders Enough For 6 Months' Peak Output

A few figures will show how the awarding of war contracts has been speeded up since the first of the year. There are still glaring examples of months' delay in arriving at decisions to place business, but nevertheless the negotiation of war contracts today in Washington is a far different thing than it was a month ago.

Again using the example of General Motors, at year-end the cumulative value of contracts and orders was $1,619,831,219, out of which $409,968,046 had been delivered. Between Jan. 1 and Jan. 10 additional orders for $769,330,000 were placed, and another $1,368,430,000 was still in negotiation. By now a portion of this has been placed. So, as of Jan. 10, the unfilled orders for war goods on books of GM, including contracts still in negotiation, totaled $3,347,623,173.

Largest share of the business placed since Jan. 1 was the tank order which, including parts and other related items, amounted to $522,000,000. General Motors will produce tanks and armored cars in four separate plants, one of them the new tank arsenal now

going up near Flint, Mich., a second the Cadillac plant in Detroit.

Another recent contract placed with GM is for antiaircraft guns of about 5-inch size, to be produced at the Grand Rapids stamping division. This plant normally hires about 2800 men, practically all on press work, but is now being tooled for the new job which will require about six months. Eventually all the men will be rehired and retrained (if they are still available) but none of the scores of presses in the plant can be used on the gun work.

Iron Foundries Seeking To Switch to Steel Casting

Generally speaking, there are three types of plants included in the 65,000,000 square feet of space in all GM facilities which do not fit in the war equipment program. They are gray iron foundries of which the corporation has four, at Saginaw, Pontiac, Flint and Detroit; stamping plants, and outlying assembly plants. The latter usually contain mostly spray booths, conveyors, paint ovens and welding and assembly fixtures, which are not adapted to the needs of armament as yet.

The outlook therefore is that plants in these categories will have to close down for the duration, unless other equipment can be moved in and present facilities removed. It is possible, and some consideration is now being given to the matter, for gray iron foundries to be re-equipped for production of heavier types of gray iron castings, such as machine tool castings; or for production of aluminum castings. Both shifts require extensive alterations but are at least within the realm of possibility.

Other gray iron foundries, independent of the motor companies, face a similar situation, and right now are furiously probing into the details involved in switching over to production of cast steel, for which there is a large demand in the war program. Some of these foundries figure that by installing a bessemer converter, they can blow down their regular cupola iron to a suitable steel, but the problem is considerably more complicated than just installing a converter, and you cannot get a converter in less than six months.

Four 3-ton converters are being planned for installation as soon as they can be built at the Saginaw Malleable Iron division of General Motors where they will be duplexed with cupolas in production of steel for as-yet undisclosed uses. This division also produces pearlitic malleable iron of the Armasteel type for various armament uses including machine gun parts.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1939	1940	1941
Jan.	356,962	449,492	524,058
Feb.	317,520	422,225	509,326
March	389,499	440,232	533,849
April	354,266	452,433	489,854
May	313,248	412,492	545,355
June	324,253	362,566	546,278
July	218,600	246,171	468,895
Aug.	103,343	89,866	164,792
Sept.	192,679	284,583	248,751
Oct.	324,689	514,374	401,360
Nov.	368,541	510,973	373,892
11 mos.	3,219,748	4,188,808	4,806,443
Dec.	469,118	506,931	.....
Year	3,732,718	4,692,338	.....

Estimated by Wards Reports

Week ended:	1941	1940†
Dec. 20	65,875	125,350
Dec. 27	24,620	82,545
Jan. 3	18,530	76,690
Jan. 10	58,990	115,935
Jan. 17	75,025	124,025

†Comparable week.

Many Salaried Men Needed For Contact and Follow-Up

A good deal of discussion has developed in recent weeks over the outlook for salaried workmen and women in the war program. Obviously many of these people associated with merchandising activities of the automobile companies and their advertising agencies, are going to be out of work, if not already in this position. One large agency here, for example, has had to scale down its force from 143 to 7, and the handful left has had 50 per cent salary cuts.

Numbers of other salaried workmen, including some minor executives, have become concerned over the outlook for the future of their jobs and, fired with patriotism, have taken off their collective coats and gone to work behind machines in plants producing war goods.

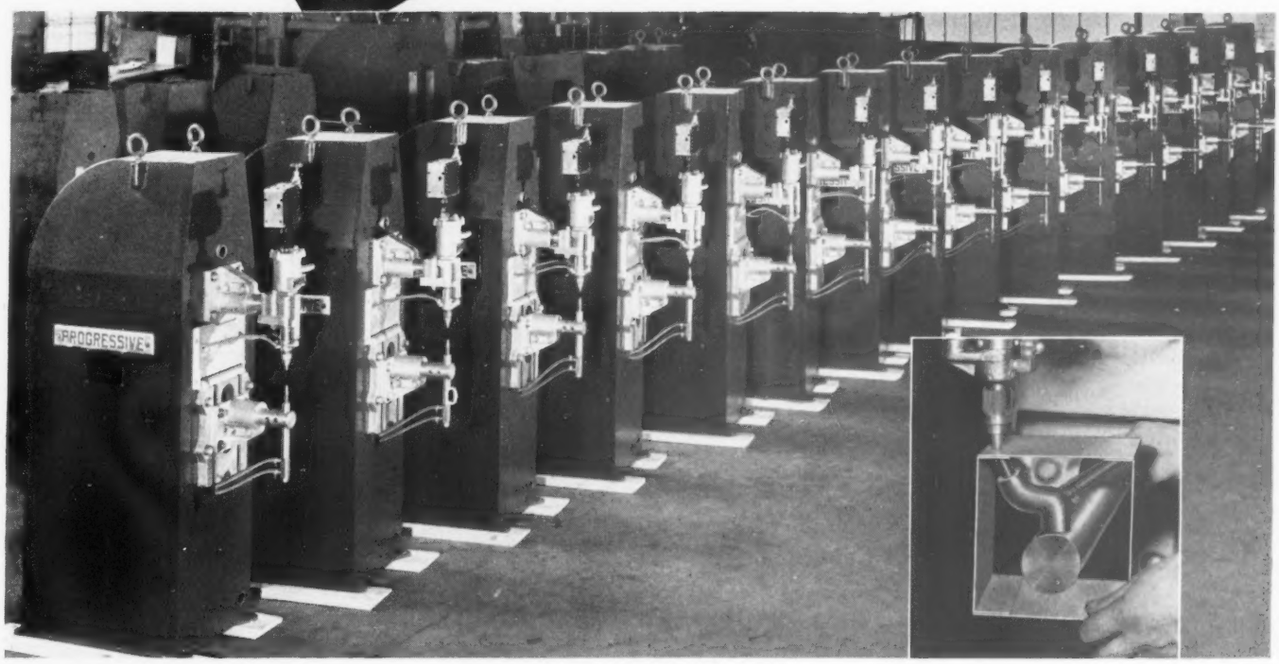
(*Please turn to Page* 94)

Plan Conversion of Automobile Plants to Full War Production

■ How to convert the automotive industry to 100 per cent war production is the problem confronting this committee, recently appointed by OPM. Left to right, Richard Frankensteen, Walter Reuther and George Addes, representing the CIO-United Automobile Workers; Chairman Cyrus Ching; H. C. Kellogg, Ford tool expert; and industry's representatives, Edsel Ford, Ford Motor Co.; C. E. Wilson, president, General Motors Corp.; and C. C. Carlton, president, Motor Wheel Corp. NEA photo

AVERAGE DELIVERY TIME 3 to 4 WEEKS!

..on PROGRESSIVE'S PEDESTAL TYPE SPOT WELDERS



DESPITE peak production levels and peak demand for welding equipment, Progressive has been able to maintain, so far, an average delivery time of only 3 to 4 weeks on complete pedestal type spot welders, ready for use. Quantity production—*and production ahead of orders, as far as possible*—is the only way in which this could be done.

Moreover, while these pedestal welders—in capacities from 35 to 200 KVA have been in regular production, numerous improvements have been incorporated including the availability of a new and improved shunt type of head. This head is also available, if desired with an attachment permitting its being swiveled a total of 180 degrees, while the lower arm may also be obtained with a rotatable construction. These special features permit clearing of obstructions and welding at various angles, in corners, etc.

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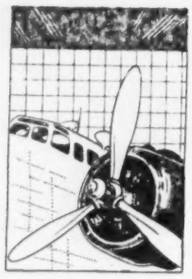
WING TIPS



Wartime airplane program is ambitious, but few doubt that it will be achieved, with the added assistance of allied industries. More bombers and fighters, fewer trainers, in prospect. . . . Coast plants get black paint on windows and roofs for 24-hour operation. . . . Enlist inventiveness of employes to lick production battle. . . . Troubles of light plane builders

■ RAISING its sights from 30,000 to 60,000 completed planes for 1942, and on to 85,000 ships for 1943, the aircraft industry is taking a deep breath and keeping its fingers crossed in the hope the goal can be reached. The projected output is considerably more difficult of attainment than the mere doubling of figures indicates, for the reason that roughly 50 per cent of the 20,000 planes built in 1941 include the light training planes which can be built in much less time than the large bombers; and plans for this year call for a reduction in training plane output compared with fighters and medium and heavy bombers.

Summarizing the current trends in aircraft production, the OEM recently listed four significant factors: Increased pooling of facilities within the aircraft industry, and between it and the automobile industry; fuller co-ordination of existing facilities so that stoppage of production because of plant damage will be held to a minimum by transfer of operations to stand-by plants; fewer types of fighter planes, with concentrated production on those types judged best by the military services; and greater emphasis on the production of bombers.

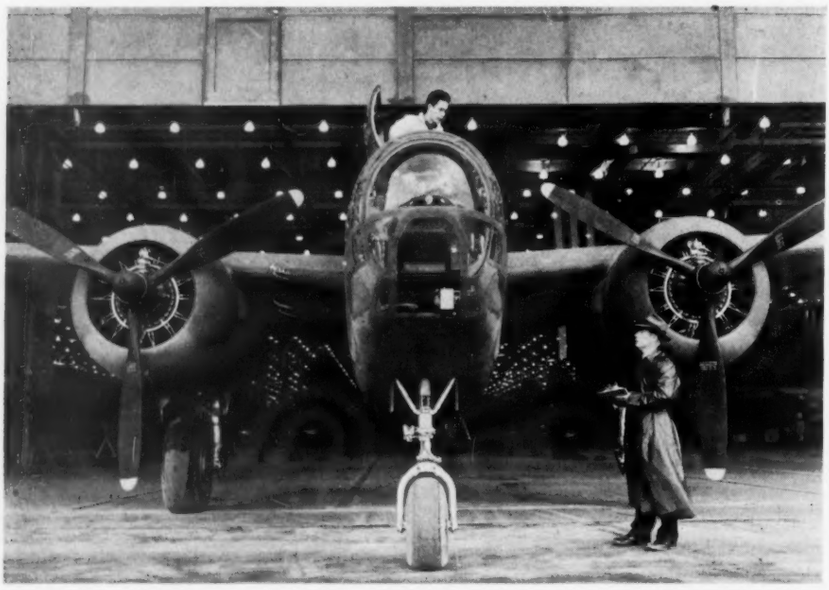
There is nothing particularly new about any of these trends, except possibly the concentration on fewer types of fighter planes. Reference has been made here in past weeks to other phases. The significant thing now is that the entire airplane program, in the planning stage at least, has been doubled. Obviously this cannot mean a doubling of present plant space and employment, since these just are not physically possible within the time limit. The answer will come partially in stepping up the amount of aircraft production work supplied by other industries, plus some expansion of aircraft assembly facilities.

However, if anyone holds to the belief that by arbitrarily shutting down the automobile industry we are automatically going to have as many more planes as we need, he is due for a severe shock. The motor industry for nearly a year has had its teeth sunk deep into aircraft work and already is shipping subassemblies to the new bomber assembly plants, as well as to other aircraft producers. In the case of one automobile interest, the flow of aircraft subassemblies has been so heavy that production had to be slowed down appreciably because the assembly plant is not yet in shape to handle the volume being shipped.

One of the many new problems which war has brought to the airplane companies is the possible disruption of operation through damage inflicted by the enemy—either from without our shores or within, incidentally. The plants on the West Coast already have carried out extensive black-out precautions, while studies are being made of a more complete co-ordination of coast plants with those in the interior section of the country. Any new plants to be built, by the way, will be located between the mountain ranges.

The six huge plants of Lockheed and Vega in California are now blacked out for 24-hour operation, 3500 gallons of jet black paint being sprayed over 1,000,000 square feet of windows and skylights by a force of 100 men working around the clock for five days. These

New Year's Card for the "Son of Heaven"



■ **"Greetings to Emperor Hirohito from 130,000,000 Americans," read the tag on this Douglas attack-bomber as it rolled from the final assembly department at Long Beach, Calif.—the first in the New Year. This type of craft should see plenty of service in the Far East, and has even been used by the British as a night fighter plane because of its high speed**

SAVE TOOLS..TIME..MATERIAL *with* SUNOCO

PERFORMANCE DATA

OPERATION — Combined drilling and facing.

MACHINE — Jones & Lamson 7A Saddle Type Universal Turret Lathe.

CUTTING LUBRICANT — 1 part Sunoco to 15 parts water.

Photo Courtesy of
JONES & LAMSON MACHINE CO.

SET A HIGH P-Q* FOR YOUR PLANT

Here's how to make a triple saving in your shop . . . and pave the way to a higher P-Q*(Production Quota). Put Sunoco Emulsifying Cutting Oil on the job!

SAVE TOOLS! Sunoco's high heat-absorbing and lubricating qualities prolong tool life . . . help keep tools sharper, longer. That's important today with high speed tool steel hard to get.

SAVE TIME! Today's production schedules demand speed. Again Sunoco proves your ally! A flood of Sunoco over tools and work permits heavy cuts at high speeds . . . faster production . . . increased output per unit.

SAVE MATERIAL! Sunoco users report savings in materials due to decreasing rejects caused by inaccuracies and faulty finishes. Sunoco puts "nth" degree accuracy on a production basis.

TEST SUNOCO in your own plant . . . under your own operating conditions. Call in a Sun "Doctor of Industry" for specific recommendations. It's the first step toward setting a higher P-Q*. Write to SUN OIL COMPANY, Philadelphia.

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plants, as well as nearly all other vital airplane plants now bristle with anti-aircraft gun protection, armed sentries, emergency traffic regulations, restricted areas and other wartime embellishments.

The black-out paint, if you are interested is a flat black, no-gloss type, available from four to five different sources. Before it was applied extensive weathering tests were performed on painted surfaces to determine opacity, drying qualities, resistance to heat and abrasion and adhesive qualities. Electric heat lamps, water and scrub brushes are the common "aging" tools.

Ideas Cut Hours Into Minutes in Plane Plants

Contributions of employes in aircraft companies to improved production methods and tools are many, and the leading companies offer handsome awards to the best suggestions turned in regularly. One of the best-known "idea" men is Arthur A. Schwartz of Bell Aircraft in Buffalo, who has to his credit such things as a rivet forging machine, countersink gage, stack drilling machine and a score of other innovations. He was named recently as the winner of an award by the National Association of Manufacturers for "contributing most to production methods during the last year."

William Holcomb of Lockheed recently received a $2500 second place medal in the Revere Brass contest for a magnetic rivetor which he developed for use on the Lockheed P-38 pursuit plane. Other Lockheed employe contributions include an extrusion miller, worked out in collaboration with Onsrud Machine Co.; a composite cable for aircraft control systems, a magnesium fire extinguisher and, the latest, an ingenious electrical system tester which has reduced the time required to check the maze of electrical installations on Lockheed planes from 16 hours to 15 minutes. It is the brain child of John E. Browne of the plant engineering department.

Materials and Labor, Chief Problems Confronting Light Plane Builders

■ "TWO main problems confront the light plane industry as a result of the present emergency," declares D. L. Zacharias, secretary and director of purchases, Taylorcraft Aviation Corp., Alliance, O., in a recent communication to STEEL. "Both are with us now. The difficulty in obtaining the materials with which most of our present airplanes are constructed is becoming more and more acute. The other important problem is that of finding the proper type of skilled labor.

"Near the top of the list of critical materials is aluminum and its alloys. The light plane industry consumes less than one-tenth of one per cent of the aluminum used by the entire aviation industry. The great demand for this metal for the building of bombers, pursuit and other military planes for this country, Great Britain and Russia has created a priority situation that threatens to eliminate this small percentage of aluminum in light planes.

"Steel tubing is used for nearly all light plane fuselage frames. The rating of A-10 given the light plane manufacturers places them pretty far down on the list as far as actual delivery of steel or any other metal is concerned.

"In several cases the writer's company has been forced to cancel orders for metal parts (landing wheel axles and aileron hinges) standing with partsmakers who had supplied the company for years, and locate other shops which were equipped to turn out the parts and at the same time had no orders on hand with priorities ahead of ours.

"The situation seems to be that the large manufacturers, generally speaking, are so fully booked with orders having high priority ratings that they are unable to take care of their regular, old-line customers on reasonable or satisfactory delivery basis.

"In view of these difficulties in the matter of obtaining normally used materials, the light plane industry has been doing a great deal of research and experimental work in an effort to find suitable substitutes. The past few months have seen the advent of various forms of so-called plastic airplanes. These structures generally are built of wood strips or plywood lengths bonded together with plastic glues or compounds. The true plastic airplane has yet to be constructed.

D. L. Zacharias

"Our company, of course, is continually experimenting with many different woods, plywoods and compositions of various kinds to supplement metals. Thus far we have replaced no part of the fuselage frame, but we are building wood ribs in place of the nicralumin ribs formerly used in the construction of the wings. The nicralumin sheeting forming the leading and trailing edges of the wings also has been replaced with plywood. We are experimenting with paper composition boards and various plastics, plywoods, and other materials in sheet form that may replace the aluminum now used in such parts.

"The labor situation presents another problem for the light plane manufacturer. In the production of aircraft, more than in any other line, the safety factor must be stressed. Besides good materials and good tools, we must have good workmen. Our plant maintains a high standard of workmanship, and every encouragement is given the men to better their work. Classes are conducted in the evenings for those who desire to become expert welders, sheet metal workers, covering and finishing specialists and woodworkers. Most of these programs are carried on in co-operation with the state and local vocational education authorities. We have also given training in aircraft inspection and in office management. Our business is relatively new and we must keep continually in mind the necessity of maintaining adequate and high quality factory and office personnel.

"From the viewpoint of sales, the light plane industry is looking forward to an era of public interest and participation in private ownership and operation of airplanes the like of which has hardly been dreamed of. This period, of course, must await the end of the present world conflict.

"At the present time private flying is more or less restricted in this country by the emergency conditions now existing. We cannot sell a private individual an airplane, for example, unless the buyer submits a signed and notarized affidavit attesting that his airplane will be used in one of a number of government-specified national defense classifications.

"Production facilities in the ensuing months may be given over in

■ **Testing a new type of hydraulically controlled airplane propeller being built by Aeroproducts Division of General Motors Corp., Dayton, O. The propeller comprises a machined steel forging skeleton over which are brazed sheet steel shrouds. In the test carbon resistors are cemented to the blades and connected by wires to a slip ring assembly on the nose, providing means to measure vibration stresses accurately**

major part, or perhaps entirely, to actual military work for Army and Navy air forces or to subcontracting work for manufacturers of bombing, pursuit and other military aircraft.

"As a matter of fact, the Taylorcraft company, along with two other leading light plane manufacturers, recently has entered the ranks of suppliers of aircraft to the Army. Our tandem model, a 65-horsepower monoplane, has been designated the "0-57" and delivered in substantial number to the Army Air Corps at Patterson Field, Dayton, O. This was the first 'production' order received from the Army, the first having been placed in September for a smaller number of planes for service testing.

"These small planes are used for short range reconnaissance and liaison work, directing artillery fire, and for directing troop and traffic movements, maintaining communication with the ground forces by two-way radio. It may be that future orders for the 0-57, or later versions thereof, may require greater attention in the months to come.

"However, we are looking at the future from the long-range viewpoint. We see a tremendous demand for individually-owned airplanes being built up in the ranks of Air Corps and Navy personnel. Not only will thousands of pilots in the services be in the market for their own planes at the war's end but they will be augmented by nonflying officers and enlisted men, to say nothing of their relatives and friends who will be influenced. Moderately-priced airplanes, economical to operate and possessing features of safety, speed, strength of construction, maneuverability and comfort, will sell in approximately the same progressively growing volume that marked the record of the automobile industry. Light plane manufacturers, naturally, will benefit most as the economical factor will attract the greatest volume of sales.

"Prices for light planes will be lower in the future. The lower the price, of course, the greater the market. The light plane manufacturers therefore are selfishly desirous of bringing about lower prices for their product. Present war conditions will not permit their accomplishing this aim, but some realization should come with the return to normalcy after the war.

"It remains for the suppliers of the raw materials used in aircraft construction, therefore, to develop new materials or new methods of producing the present materials that will allow a steady supply and lower costs to the airplane manufacturer.

"It may be that metal construction will become obsolete, giving way to wood and plastics. Or it may be that, given sufficient time for the proving of the newer materials, we will continue using or return to the use of aluminum, duralumin, steel tubing and other metals. It certainly looks like it's the metal industry's turn to move."

Enlarging Tin Smelter For 30,000 Tons Annually

■ The United States' new tin smelter in Texas City, Tex., will be enlarged to produce 30,000 tons of tin annually from Bolivian concentrates, and will provide about one-third of normal consumption. Originally the smelter was designed to have annual capacity of 18,000 tons.

This country's position as regards tin is pretty fair, according to Federal Loan Administrator Jesse Jones. The government has in stock or afloat 50,000 tons while industry has that much or a little more. In addition the government has imported enough concentrates from the East Indies and Bolivia to make 25,000 tons.

Mr. Jones also announced that OPM is making a study of further expansion in aluminum capacity and that Reconstruction Finance Corp. is ready to finance the plants when OPM asks for them. Locations for contemplated new plants have not yet been selected, he said.

1941 Gear Sales Index 74 Per Cent Above 1940

■ Index of industrial gear sales in December was 0.83 per cent above that of November and 16.8 per cent over December, 1940, according to the American Gear Manufacturers' Association, Wilkinsburg, Pa. For 12 months the index was 74.4 per cent above 1940.

Comparative index of sales in December was 243, against 208 for the same month in 1940 and 241 in November. The index is based on 1928 as 100. The figures apply only to industrial gears, excluding automotive and high-speed turbine gears.

OPM, Navy To Survey Scrap and Automobile Wreckers' Yards

WASHINGTON

■ REORGANIZATION of the OPM Iron and Steel Branch under its recently-appointed chief, Charles E. Adams, will be completed within the next week or two, it is said here. Present plans call for four or five divisions within the branch, including one each for raw materials, plant facilities, services, finished products, and possibly one other.

All projects in the 10,000,000-ton expansion program are reported to have been allocated and sent to the Defense Plant Corp. The various projects are not numbered as to which shall come first.

Announcement of a survey to be made by OPM representatives and uniformed naval officers of all scrap yards and automobile wreckers' yards is expected soon. One purpose will be to ascertain if these yards actually are moving the scrap they have on hand. OPM is being advised of shutdowns at a number of steel plants due to the scrap shortage. The situation is becoming so critical that it is receiving careful attention by OPM.

Some government officials believe the rural person who has scrap for sale is entitled to the same price as the man who is situated near the steel mill.

The inventory of scrap and wreckers' yards, with a proposed 100 per cent penalty tax on scrap held more than 90 days, is part of OPM's concentrated effort to bring out all available scrap.

Scrap Institute Would Curb Shipments for Non-War Use

Curtailment of steel and iron scrap shipments to manufacturers of nondefense materials until all war requirements have been fully met is advocated by directors of the Institute of Scrap Iron and Steel Inc., Washington.

"No war work has been lost by shortage of scrap," says Edwin C. Barringer, institute executive secretary. "The scrap institute supplied more than 28,000,000 net tons during 1941. About 800,000 tons of this, sufficient to keep all our mills and foundries going for 11 days, was sent to England and to neighboring countries to the north and south with approval of the government. It is our hope to locate and prepare 32,000,000 tons in 1942 so that steel production can be stepped up to 90,000,000 tons, thus filling every war need and leaving a big balance for nonwar and civilian use."

Await OPM Action To Force Wrecking of Abandoned Cars

Pittsburgh scrap dealers expect action soon by OPM to release steel scrap tonnage held in automobile "graveyards." Joseph H. Miller, chairman of the Pennsylvania automobile wrecking committee established last year by OPM, states that owners of these yards have not been co-operative, claiming their stocks are valuable for used parts.

Cleveland Committee Seeks New Sources for Old Material

Search for untapped sources of iron and steel scrap has been undertaken in Cleveland by a ten-member committee appointed by Mayor Frank J. Lausche. Later the committee may launch a popular collection campaign.

Included in committee's membership: Chairman, A. L. Prentice, manager, scrap reclamation, New York Central railroad; Thomas H. Nicholl, vice president, Cleveland railway; Carl A. Ilgenfritz, in charge of purchases and raw materials, Republic Steel Corp.; Thomas E. Savage, purchasing agent, Erie railroad; Elmer L. Eyssen, vice president and sales manager, William Bingham Co.; and Frank Oviat, secretary-treasurer Otis Steel Co.

Saving Automobile License Plates

■ **Salvaging old automobile license plates for conversion into war materials is being undertaken in a number of states. Above, a motorist drops 1941 plates into a bin erected in St. Louis for that purpose. In Wisconsin the state motor vehicle department has requested car owners to contribute old license plates to a scrap salvage campaign. Boy scouts assist in the collection drive, "which may provide as much as 500 tons of scrap."**

"Steel Output To Drop Several Million Tons"

■ Shortage of raw materials will handicap 1942 iron and steel production, but output will be more than adequate to meet all demands of the war program, Dr. Bradley Stoughton, president, American Society for Metals, declared before a recent meeting of the Chicago chapter. Dr. Stoughton is director of metallurgical engineering and dean emeritus, Lehigh University, Bethlehem, Pa., and chief of the heat treating equipment unit, tool section, OPM.

Lack of scrap will restrict steel production to a figure several million tons less than in 1941, and shortage of coke will prevent full use of existing and new blast furnaces to make pig iron, Dr. Stoughton said. Until new coke ovens can be built and placed in operation, production of pig iron cannot be expanded sufficiently to offset lack of scrap in steelmaking.

Government Inquiries

The following prime contracts are pending, with closing dates for bids as indicated. QR refers to quantity required. Bidding forms on these items can be obtained only by wiring, mentioning schedule number, to the Procurement Branch of the service heading the list of requirements. Field offices of Division of Contract Distribution, OPM, generally have available for inspection and examination, schedules, invitations, specifications and drawings (where required) concerning these contracts.

BUREAU OF SUPPLIES, ACCOUNTS NAVY DEPARTMENT, WASHINGTON

9968—Spikes, marline, wire rope, 16″ long, QR-6,881. Bids Jan. 29.

9970—Aluminum-alloy; plates, bars, etc. QR-misc. large. Bids Jan. 20.

9973—Transformers, welding, 300 amp. 220V., single phase, 60 cycle primary complete with 30′ 3-conductor primary cable; and accessories; QR-8 sets, 440 Volt, QR-50 sets. Bids Jan. 20.

9975—Units, generator test, complete, QR-3. Bids Jan. 27.

9978—Clocks, deck, QR-5440. Bids Jan. 27.

9980—Sets, threading, bolt and screw, QR-2303 navigation 6, pipe 684. Bids Jan. 29.

9981—Diestocks; and tap wrenches, QR-misc. Bids Jan. 29.

9982—Igniters, oxyacetylene-torch; tips QR-13,248. Bids Jan. 29.

9983—Covers, closing for ventilation systems, steel plate sizes from 3 to 14″ QR-1400. Bids Jan. 20.

3—Cable, single conductor, portable QR-30,000′. Bids Jan. 27.

12—Valves, gate, composition, union end, with pre-inserted rings of silver brazing alloy, stems of nickel-copper alloy, 200 lbs. per sq. in. QR-2; Valves, swing check, composition, union end, 200 lbs. per sq. in. with pre-inserted rings of silver brazing alloy, QR-2; globe and angle QR-2. Bids Jan. 20.

21—Conveyors, roller, gravity, straight sections, 6′ x 8′ QR-40; scooters, motor driven, with express compartment, QR-2; trucks, platform, steel, cap. 2500 lbs. platform size 40″ wide 72″ long QR-48; trucks, platform, lifting, heavy duty, multiple stroke, hydraulic, QR-48, equal to Barrett Model X-760; trucks, trailer, complete with wooden deck, tongue and coupling bar, platform size 36″ wide, 72″ long, height of platform 14″ cap. 4000 lbs. QR-36; equal to Colson wood deck steel frame trailers No. 19-B-781; trucks, two wheel hand, heavy duty roller bearing, molded on rubber tired wheels, complete with hub caps and fittings, QR-48, equal to No. 20 Thomas Hand truck. Bids Jan. 27.

22—Trucks, tilting, tiering, telescopic fork, type with forward tilt unit, gasoline motor driven, complete, QR-12. Bids Jan. 27.

23—Tractors, industrial gasoline engine driven, medium duty, QR-4. Bids Jan. 27.

27—Litters, metal, QR-2600. Bids Jan. 20.

42—Compressors, air motor driven, spare parts mechanical and electrical special tools and wrenches, plans, and instruction books, QR-64. Bids Jan. 22.

54—Lighters, open QR-13. Bids Feb. 3.

56—Lighters, open 500 T, non-self propelled, QR-33. Bids Feb. 3.

62—Trailers, 20-ton, QR-8. Bids Jan. 16.

9984—Forge-Cups, plumbers', long handle, QR-3005. Bids Jan. 29.

9989—Valves, composition, gate, flanged for ventilation systems, QR-300. Bids Jan. 20.

9999—Sieves, foundry, brass wire bottom, dia. 18″, QR-1319. Bids Jan. 29.

U. S. MARINE CORPS NAVY BLDG., WASHINGTON

1326—Knives, hospital corps, QR-2944; forks, Haversack, M1926, steel, tin coated, QR-82,506; knives, Haversack, QR-78,950; spoons, Haversack, M1926. QR-82,506. Bids Jan. 15.

1335—Rotary converters for converting direct current into alternating current. Input, 115 V direct current. Output, 110 V., 60 cycle, single phase, alternating current, capacity 1000 V. amperes, equal to DC and AC Rotary Converter mfrd. by Janette Mfg. Co. Chicago, Ill., QR-8. Bids Jan. 16.

1346—Units, water purification, complete with four-wheel trailers, to Philadelphia and San Francisco, QR-10. Bids Jan. 16.

1349—Vegetable peeling machines, with peel trap, heavy duty, QR-18; meat grinders, counter type, QR-25; meat slicing machines, QR-25; cooks tables, metal top, 8′-0″ long by 3′-0″ wide, QR-40; preparation tables, wood top, 8′-0″ long by 2′-6″ wide, equipped with 2 drawers, QR-20; food mixing machines, electric motor driven, 80-qt. capacity, QR-3. Bids Jan. 15.

WAR DEPARTMENT, AIR CORPS WRIGHT FIELD, DAYTON, O.

42-1694—Pins, flat head, and taper, threaded, 336 items, QR-Large. Bids Jan. 20.

42-1726—Cowling fittings: grommet, spring, and stud, 58 items, QR-large. Bids Jan. 20.

42-1745—Receptacle, external battery, QR-1755. Bids Jan. 19.

42-1722—Sling assembly, hoisting, QR-400. Bids Jan. 20.

42-1751—Scooter, motor, gasoline, QR-500. Bids Jan. 21.

42-1760—Nuts—engine slotted and engine plain steel, QR-341,136. Bids Jan. 19.

42-1754—Nut, self-locking, steel 22 sizes, QR-large. Bids Jan. 20.

42-1660—Pliers, 13 sizes and types, QR-3240. Bids Jan. 20.

42-1744—Hinge, continuous, aluminum, alloy, QR-3600. Bids Jan. 21.

42-1755—Solenoid assembly, 12 V. D.C., QR-900. Bids Jan. 21.

42-1762—Snubber, engine mount, upper and lower, QR-50,000. Bids Jan. 21.

42-1770—Gage assembly, high pressure, air testing, QR-500. Bids Jan. 20.

42-1756—Bolts—aircraft drilled head, steel, clevis, etc. 176 items, QR-large. Bids Jan. 22.

42-1766—Drill, electric, portable, ¼″ cap. Universal current 110 V., QR-16,050; ⅜″ cap. QR-300; ½″ cap. QR-1590. Bids Jan. 23.

Sub-Contract Opportunities

Data on subcontract work are issued by local offices of the Contract Distribution Division, OPM. Contact either the office issuing the data or your nearest district office. Data on prime contracts also are issued by Contract Distribution offices, which usually have drawings and specifications, but bids should be submitted directly to contracting officers as indicated.

Cleveland office, Division of Contract Distribution, OPM, Union Commerce building, is seeking contractors for the following:

78-1223: Subcontractor wanted to machine complete Brackets approximately 17⅜ inches x 12 inches and supports 18½ inches long "V" shape, from approximately 2¾ inches to 7¼ wide. Operations indicated planing, drilling, and boring. Quantities 1400 of each. Material, magnesium castings furnished. Blueprints in our file.

79-1230: Western manufacturer needs subcontractors who have the following equipment not now being fully utilized. Milling machines for spline cutting—48-inch radial drills, turret lathes, jig borers. Small tool room engine lathes working to a tolerance of .0002.

Chicago office, Division of Contract Distribution, OPM, 20 North Wacker Drive, is seeking contractors for the following:

SBMC-A-1229: A Chicago manufacturer is in urgent need of subcontractors for the production of aluminum inspector's tool cases made of .032 half hard sheet aluminum, which will require deep drawing, long stroke punch presses, as well as some small punch presses and assembly facilities. Dies and tools to be furnished by the subcontractor. Present requirement to start with 420 boxes. Blueprints available at this office.

LD-AMC-A-1005: An airplane engine producer desires to subcontract for the majority of the parts required in a project calling for a limited quantity of large airplane engines. These aircraft engine parts must be manufactured to close tolerances and finishes must be equal to grinding, or better. Quantity is limited but this work is very essential and may open up to increased production in the future for concerns having suitable equipment. Practically every type of machine, including all sizes of grinders will be required.

COD-A-1007: Chicago manufacturer prepared to subcontract body of fuze requiring automatic screw machines 1½-inch or over capacity. Second operation equipment such as small hand screw machines and fairly accurate drilling equipment also needed. Initial order amounts to 100,000 units. Price contractor will furnish necessary materials. Drawings available for inspection at this office.

Detroit office, Division of Contract Distribution, OPM, Boulevard Building, is seeking contractors for the following:

I. S. 119: Firms experienced in forming and fabricating Inconel are requested to contact this office.

I. S. 118: Firms with any or all of the following equipment available for subcontracting please contact this office: 16 Warner & Swasey No. 3A turret lathes, 13 Jones & Lamson 6 x 36 inch thread grinders, 46 Yoder Co. No. 3 horizontal millers, 46 Defiance Machine Co. horizontal millers, 46 Cincinnati Gilbert Machine Co. No. 3 horizontal millers, 24 S-472 Paxto power shears.

I. S. 121: Forgings wanted requiring 10,000 pound steam drop hammer. Steel and dies furnished by prime contractor who is looking for source to produce frequent repeat orders on standard items.

I. S. 122: Shops having following equipment available for work, please contact this office: Horizontal milling machine, engine lathe (24-inch), drill press up to 1-inch and gear cutting or index milling machine. Quantities required, 2500 pieces at rate of 10 to 20 pieces per day. Considerable hours required.

I. S. 124: Forged ring or trained circles. Boring mills able to take work 10 feet in diameter, requiring 56 hours of work on each ring. Unlimited quantities. Shops having above equipment available for work, please contact this office.

Steel Exporters Ask Price Ceiling Relief; Some Face "Extinction"

NEW YORK

■ IRON and steel exporters continue their drive to obtain relief from the OPA ruling of last month which provided that all steel for export must be sold at domestic price levels. Unless relief is forthcoming shortly a number of the export houses, many long established, will have to close.

Under normal conditions, these agencies were usually given a commission by the steel producers averaging 2½ per cent.

Now, however, the situation is vastly different. In the first place, the mills do not need export business and consequently are paying no commission. Moreover, they are all quoting on a strictly f.o.b. mill basis and are assuming no obligations beyond that point. Thus, it is up to the exporters to make all arrangements, such as providing adequate ratings, export licenses, attending to letters of credit, providing foreign agent's commission, demurrage and warehouse charges, etc., all of which actually boost their overhead considerably.

Appeal Based on Cost Data

Various hearings have been held and many appeals made by exporters and organizations interested in their welfare. One of the latest is embodied in a letter by the Commerce and Industry Association of New York Inc., formerly the Merchants Association, to R. H. Whitman, in charge of the steel price division of OPA.

An adequate differential for export sales on iron and steel above the established domestic ceiling was urged, with the request accompanied by a summary of data on exporters' overhead costs as reported by 57 exporters in answer to a questionnaire sent to them by the association.

The summary was based on 1941 business and the fact was stressed that in 1942 it was almost certain that business handled by individual exporters would be greatly reduced, with a corresponding increase in their overhead cost per ton.

"In this connection we wish to point out that the shipper reporting the smallest tonnage in the questionnaires also reported the highest overhead costs," the latter stated. "The majority of exporters are now handling less carload shipments almost exclusively. Even those who handled some carload shipments are no longer able to ship in quantities because of increasing difficulty in obtaining materials for export."

Referring to statements made by the OPA of its intention to eliminate undesirable "shoe-string" firms, the letter stated: "It has already been pointed out to you that an insufficient export differential will most seriously affect the long established export houses which ordinarily have greater responsibilities, more employes and larger overhead."

Questionnaires revealed that the great majority of the exporters are not receiving commissions from mills; that a few are receiving commissions on special lines for special markets only. A large proportion of the reports pointed out that commissions formerly received from the mills were discontinued six to eight months ago.

Based on the exact percentage costs and tonnages reported, the average overhead cost per ton exported was now 9.946 per cent of their f.a.s. selling price in 1941.

According to the association, the exporters' figures provide convincing evidence that the regulations contained in rule 49 governing iron and steel price ceilings are prohibitive to exporters continuing to ship these commodities. The OPA was asked to make an early decision and to make its decision known to exporters as early as possible.

Meanwhile, many export orders have been suspended, with some actually canceled. South American buyers, the consumers principally affected by the ruling, are described as being in a "frantic" position.

M. A. Hanna To Develop Nevada Manganese

■ M. A. Hanna Co., Cleveland, through its subsidiary, Manganese Ore Co., will begin immediate development of extensive western manganese ore claims and will construct a pioneer treating plant. The Hanna claims are located 15 miles southeast of Las Vegas, Nev. Production will be under way by next December, and is expected to attain a rate of 100,000 tons high-grade concentrate annually.

An agreement has been entered into with Defense Plant Corp. and the Metals Reserve Co. for the construction and operation of a $4,500,000 mill to treat the low-grade manganese in the deposits, which include the famous Three Kids claim from which manganese was mined during the last war. Entire output will be sold to Metals Reserve Co.

Manganese content of the Hanna ore averages 20 per cent; deposits are among the richest and most easily worked in this country. Claims contain enough ore for full scale operations for three or four years, with ore coming from open pit operations. Additional underground reserves exist to maintain the mill longer if conditions warrant. Open pit mining will be started early to accumulate a reserve by the time the mill is completed.

Mill capacity will be 1000 tons of crude ore daily, which will process into 300 tons of 60-65 per cent manganese ore nodules or sinter. Perfection of the sulphur-dioxide refining process, a method of separating out the manganese, has been achieved for the Hanna company by the Pan-American Engineering Co., Berkeley, Calif., which has been operating a 5-ton per day capacity experimental plant for the past six months.

Process involves several steps including crushing, grinding, filtration, leaching, evaporating, roasting, and, finally, sintering or nodulizing the resultant manganese concentrate.

Announces "New Process" to Take Manganese from Low-Grade Ore

New process to extract manganese from low-grade ores was announced last week by Garland Peyton, director of mining and geology in Georgia. Recent experiments, he said, have indicated that through a "magnetic roast" in a special furnace it is possible to bring low-grade ore, which is abundant in Georgia, up to government specifications.

Experiments were conducted by the research staff of the Tennessee Valley Authority at Norris dam. TVA men, with suggestions from Mr. Peyton, worked out a formula calling for intensive heat treatment which changes the iron content to the desired magnetic type. After heating the ore is passed through a magnetic separator which raises the grade to the quality required.

Company Organized To Mine Manganese in Virginia

Biggam Manganese Co. Inc. has been incorporated in Ohio to develop manganese deposits in Virginia. Company has leased 2700 acres in Bland and Giles counties and has been producing 100 tons of manganese a week from its pits, according to Herbert J. Cox, Canton, O., one of the incorporators.

■ Cold Metal Process Co., Youngstown, O., distributed $1,400,000 in dividends at the year-end, chiefly to eight stockholders. The payment was at the rate of $700 per share on 2000 shares of $50 par value stock.

Canada Places New Restrictions on Use of Steel in Nonessential Items

TORONTO, ONT.

■ MORE drastic restrictions on the use of steel in nonessential production were announced in Canada last week, while at the same time some restrictions on steel sales were eased. F. B. Kilbourn, steel controller, said use of steel plates, structural shapes and bars for necessary maintenance and repairs will be allowed without permit, and also ruled that without permit, steel manufacturers, comprising steel fabricators and industries legitimately using steel in the manufacture of their products, are permitted to order their needs from primary steel producers, rolling mills, wholesalers and jobbers. Previously orders of this nature were accepted only on approval of the steel controller. This new ruling appears to be in line with conditions prevailing in the United States.

Dominion Steel & Coal Corp. Ltd., Sydney, N. S., has announced plans for the construction of a new blast furnace on which work will be started soon. Company now has three stacks blowing. Company also is installing a new open hearth furnace and is putting its plate mill in shape for production.

Toronto Shipbuilding Co. Ltd., a government-owned company, has received a contract to proceed at once with construction of 15 minesweepers of a new type, which are larger than those formerly turned out. Contract involves approximately $13,000,000. Company will devote itself exclusively to the production of minesweepers, in conformity with a policy recently adopted by D. A. Clarke, director general of shipbuilding.

A new order issued by J. R. Nicholson, deputy controller of supplies, has added more items to the list of electrical appliances under control. Manufacture after Jan. 30 of any electric grills, percolators, electric stoves for coffee makers and electric tea kettles is banned. After April 29 the manufacturers will not be permitted to sell or display those articles, but wholesalers and retailers will be allowed to dispose of their stocks on hand. The manufacture of electric irons, electric toasters and electric household fans is placed on a 50 per cent quota based on production for 1940. Parts for repair of electric appliances are exempt from the order, and permission will be given for manufacture of these articles when ordered by the Department of National Defence or the Department of Munitions and Supply.

Total value of contracts awarded by the Department of Munitions and Supply on Canadian, United Kingdom and other accounts from July 14, 1939, to Dec. 31, 1941, was $3,201,402,489.

Department, for the week ended Dec. 30, placed 2278 contracts with total value of $17,254,488 of which orders valued at $775,542 were awarded to six United States companies. Week's awards included electrical equipment purchases totaling $3,440,803 and ordnance orders amounting to $2,562,302, while one war construction contract was for $2,926,100. Orders include:

Dockyard Supplies: Anglo-Canadian Wire Rope Co. Ltd., Montreal, $14,054; Canada Wire & Cable Co. Ltd., Montreal, $18,755; Page-Hersey Tubes Ltd., Toronto, $30,611; Donald Ropes & Wire Cloth Co., Hamilton, Ont., $12,282; Lister Iron Works, Vancouver, B. C., $5095.

Land Transport: Eastern Steel Products Ltd., Montreal, $9900; Gutta Percha & Rubber Co. Ltd., Toronto, $107,975; Seiberling Rubber Co. of Canada Ltd., Toronto, $30,059; B. F. Goodrich Rubber Co. of Canada Ltd., Kitchener, Ont., $32,361; C. T. Lount, Winnipeg, Man., $14,896; R. J. Fudge, Moosomin, Sask., $7035.

Aircraft: Aviation Electric Ltd., Montreal, $30,673; British Aeroplane Engines Ltd., Montreal, $6062; Canadian Wright Ltd., Montreal, $334,505; Noorduyn Aviation Ltd., Montreal, $309,311; Railway & Power Engineering Corp. Ltd., Montreal, $36,891; Standard Tube Co., Ltd., Ottawa, Ont., $10,436; Fleet Aircraft, Ltd., Fort Erie, Ont., $29,730; MacDonald Bros. Aircraft Ltd., St. James, Man., $15,170.

Instruments: Ontario Hughes-Owens Co. Ltd., Ottawa, $7920.

Electrical Equipment: Canadian Marconi Co., Montreal, $420,000; Canadian National Telegraph Co., and Great North Western Telegraph Co. of Canada, Montreal, $65,778; Northern Electric Co. Ltd., Ottawa, $2,535,025.

Fire Fighting Equipment: Dominion Rubber Co. Ltd., Ottawa, Ont., $5184; Gutta Percha & Rubber Co. Ltd., Ottawa $5184; Dunlop Tire & Rubber Goods Co. Ltd., Toronto, $5184; Goodyear Tire & Rubber Co. of Canada Ltd., Toronto, $5184; Bi-Lateral Fire Hose Co., Kitchener, Ont., $5184.

Ordnance: John Inglis Co. Ltd., Toronto, $2,016,000; Atlas Steels Ltd., Welland, Ont., $539,897; George White & Sons Co. Ltd., London, Ont., $6405.

Munitions: Millen & Freres, Montreal, $9665; Government of the United Kingdom, through the Department of Munitions and Supply, Overseas Accounting Branch, Ottawa, $555,488.

Metals: Atlas Steels Ltd., Welland, Ont., $46,843.

War Construction Projects: E.G.M. Cape & Co. Ltd., Montreal, $2,926,100; Foundation Maritime Ltd., Montreal, $270,563; J. P. Porter & Sons Ltd., Montreal, $215,000; Fundy Construction Co. Ltd., Halifax, N. S., $126,000; Bird Construction Co. Ltd., Regina, Sask., $65,578; Buchanan Construction Co., Calgary, Alta., $55,928; Milne & Nichols, Toronto, erection of plant addition for Research Enterprises Ltd., Leaside, (Toronto), $220,000; Anglin-Norcross (Ontario) Ltd., Toronto, addition to Small Arms Ltd., plant at Long Branch, (Toronto), $190,000; W. C. Brennan Contracting Co., Hamilton, $50,000; Assiniboia Engineering Co. Ltd., and Dutton Bros., Winnipeg, Man., $79,000; Bennett & White Construction Co., Calgary, Alta., $80,000.

American Subsidiary in Dominion Steps Up Tanks

■ **Canadian tank production is gaining in volume in Montreal Locomotive Works, subsidiary of the American Locomotive Co. NEA photo**

Farm Implement Makers and Unions In Accord on War Production Policy

CHICAGO

■ TENTATIVE agreement governing transfer of workers to war production has been drafted by management and labor leaders representing Midwestern farm equipment plants and their 96,000 employes.

Representatives of nine farm implement manufacturers, whose normal production already is curtailed sharply by priorities, and the labor leaders met in closed session here Jan. 9, but it is understood they favored a labor policy similar to that adopted for the automotive and rubber industries.

If finally approved by the conference, called by Sidney Hillman, OPM labor director, the agreement would provide:

1. Protection of seniority rights if the worker is transferred to war production in another company or to a different department within his own company.

2. Preferential hiring of displaced workers when farm implement companies get war orders, or resume normal production.

3. Priority on the service of a displaced worker by his original employer if the employe has not obtained a job in a more important war industry; displaced employes would be required to report periodically to their original employers.

It is understood also that management leaders favored effecting a general policy by individual plants, while labor representatives wanted a standard industry-wide policy on displacement, transfer and exchange of the workers in the change-over of the industry to war production.

Companies represented at the conference included: International Harvester Co., Chicago; Allis-Chalmers Mfg. Co., Milwaukee; J. I. Case Co., Racine, Wis.; Oliver Farm Equipment Co., Chicago; Minneapolis-Moline Power Implement Co., Minneapolis; Deere & Co., Moline, Ill.; Massey-Harris Co. Inc., Racine, Wis.; Caterpillar Tractor Co., Peoria, Ill.; and David Bradley Mfg. Works, Bradley, Ill.

Aliens Permitted To Work in Plants with War Contracts

In answer to questions recently raised as to restrictions on the employment of aliens in war industries, William S. Knudsen and Sidney Hillman have made the following statement:

"There is no legal barrier to the employment of aliens in any factories having war contracts. It is only in those manufacturing plants which produce secret items for the Army or Navy that the permission of the armed services must be secured by the employer before aliens are hired.

"Thousands of British, Norwegian, French, Polish, Dutch, and other nationals of the United Nations and of neutral countries are currently employed in plants turning out war materials. There are likewise thousands of able, alien workers whose loyalty to the United States is without question. The aims of democracy and the needs for efficiency alike demand that this ability and loyalty shall not

Kentucky and Comanche Learning How To Operate

■ **Left, Kentucky youths learn to operate a power drill in an out-of-school program sponsored by the United States Office of Education in Schenley Distillers Corp.'s machine shop, Frankfort. Right, Clifton Ignacio Martinez, a Comanche, operates an electrical welding machine in the Douglas Aircraft plant, Santa Barbara, Calif. NEA photos**

U. S. BOND DRIVE: San Francisco—A rousing, unanimous "Aye" was the response of these 5000 Western Pipe & Steel Co. employes, pledging the purchase of $200,000 in defense bonds, through the California Defense Savings staff's payroll allotment plan, whereby deductions will be made from paychecks. Note shipbuilding ways in background. A union jurisdictional dispute plagued these yards a few weeks ago, but today it's "Aye" for Uncle Sam. NEA photo

go to waste. In doubtful cases, the appropriate government agencies are prepared to take proper measures. In all-out war production, we must utilize every human resource with sanity, with common sense and the conviction that no one shall be denied opportunity to participate in the war effort because of race, creed, color or national origin."

Large Supply of Common Labor, But Few Skilled Workers

PITTSBURGH

Labor scarcity here may prevent some defense contractors from expanding their work week. Hiring new men, even inexperienced workers, has become a difficult job. According to the state department of public assistance there are less than 28,000 relief cases in which the recipient is listed as "employable," and it is certain that a large number of these are not considered employable by industry, due to their lack of ability.

Local offices of the state employment agency report a large supply of unskilled workers, and a fair supply of machine operators, but no skilled tool men or others in that class. This is the key to the situation, as with relatively few skilled set-up men, toolmakers and the like, the 168-hour week would no longer be an impossibility.

Plate and structural fabricators in this district report acute shortage of skilled welders and layout men. It would be feasible to add another shift if the key men were available, as such a course would not increase costs unduly, and might reduce them by eliminating some overtime.

Some employers here have been using an "understudy" system to train more key men.

Weirton Steel Employes Start Bond Club

■ Employes of Weirton Steel Co., Weirton, W. Va., have organized a Defense Bond Club, the plan for which is reported to have originated with them. They requested that deductions be made from their pay, the money to be invested for them in bonds.

A button is given an employe to indicate he is buying a bond. When deductions are sufficiently large a bond is bought for him, and another button—called a "badge of patriotism"—is given, indicating the completed purchase.

The club has opened its membership to the public, and any person submitting proof of purchase of a bond, using a club certificate to be signed by the seller, will be given the badge-of-patriotism button and a colored windshield sticker, showing membership in the club. Certificates may be obtained on application to the club, Box 469, Weirton, W. Va.

Bond Purchasers Will Share Company Profits

Unique proposal for employer-employe co-operation to finance the war was offered last week by Vulcan Lead Products Co., Milwaukee. Employes who buy defense bonds will be recognized as "stockholders without certificate" according to the degree in which they invest in defense savings securities. Thus a worker who buys $100 of defense bonds will be considered as a stockholder in the company for an equal amount. He will not receive the stock but will be paid the dividends paid on an equivalent amount of stock.

Donate One Day's Work

■ More than 2200 men and women of Fleetwings Inc., Bristol, Pa., including office workers and executives, last week donated one day's work to the government, Frank de Ganahl, president of the aircraft and aircraft parts company, announced. Hundreds of employes had voluntarily petitioned the management on such a proposal.

STEEL

Promising, Because It Points to Speed

IT IS six weeks since Pearl Harbor was attacked and almost two weeks since President Roosevelt announced the war production quotas for 1942 and 1943.

The shock of the Pearl Harbor incident was supposed to have brought this indolent nation to its senses. The President's positive statement that we shall turn out 60,000 planes, 45,000 tanks and 8,000,000 tons of ships in 1942 should have impressed us with the magnitude of the job ahead.

• • •

Whether or not these challenging events have changed or are changing our attitudes sufficiently to assure final victory remains to be seen. The record of accomplishment since Pearl Harbor is not too encouraging.

To our national credit it may be said that the spirit of unity has been improved tremendously by the events in the Pacific. Also the public response to the big armament program and to the unprecedented war budget has been gratifying. Likewise, the reaction to the rationing of new automobiles and to the limitations on tires has been wholesome.

From the standpoint of government policy affecting production, two major events belong on the credit side of the ledger. One is the decision and the determination to place the automobile industry on an almost 100 per cent war production basis. The potentialities of this move cannot be overestimated. It represents an important step forward in the war effort.

The second major event was the belated appointment by President Roosevelt of Donald M. Nelson as the one-man boss of the newly created War Production Board. The selection of the hard-hitting Nelson for this important post and the President's apparently reluctant acquiescence to the clamor for a single head of the production set-up are acts which were vitally necessary to the success of the war effort.

Of course there are other items to be entered on the credit side of the journal during the first six weeks of our participation in actual war, but they are secondary to those enumerated.

On the debit side, the greatest single liability is the sluggishness with which everyone from the President down is adjusting himself to the conditions of actual war. We are acting as if we were resigned to the fact that the adjustment from a defense to a shooting war economy will take a long time.

We have got to get this sluggishness out of our systems at once. We must realize that already we are woefully behind schedule on the change-over.

• • •

Also we must revise our sense of values. During the defense period we placed an exorbitant premium on factors which are trivial in wartime.

Then we counted the cost; today we should count the time and the result.

Then we held back to prevent hurting the feelings of individuals or groups; today feelings should not be considered above time and necessity.

Then we quibbled over method; today we should strive for direct action that will produce results.

Then we were slow; today we want speed and more speed.

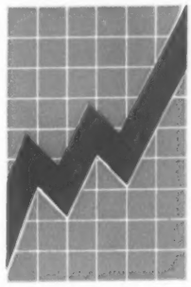
Nelson is a good choice because he knows these new values.

E. L. Shaner

EDITOR-IN-CHIEF

Jan. 19, 1942

The *BUSINESS TREND*



All Out War Effort

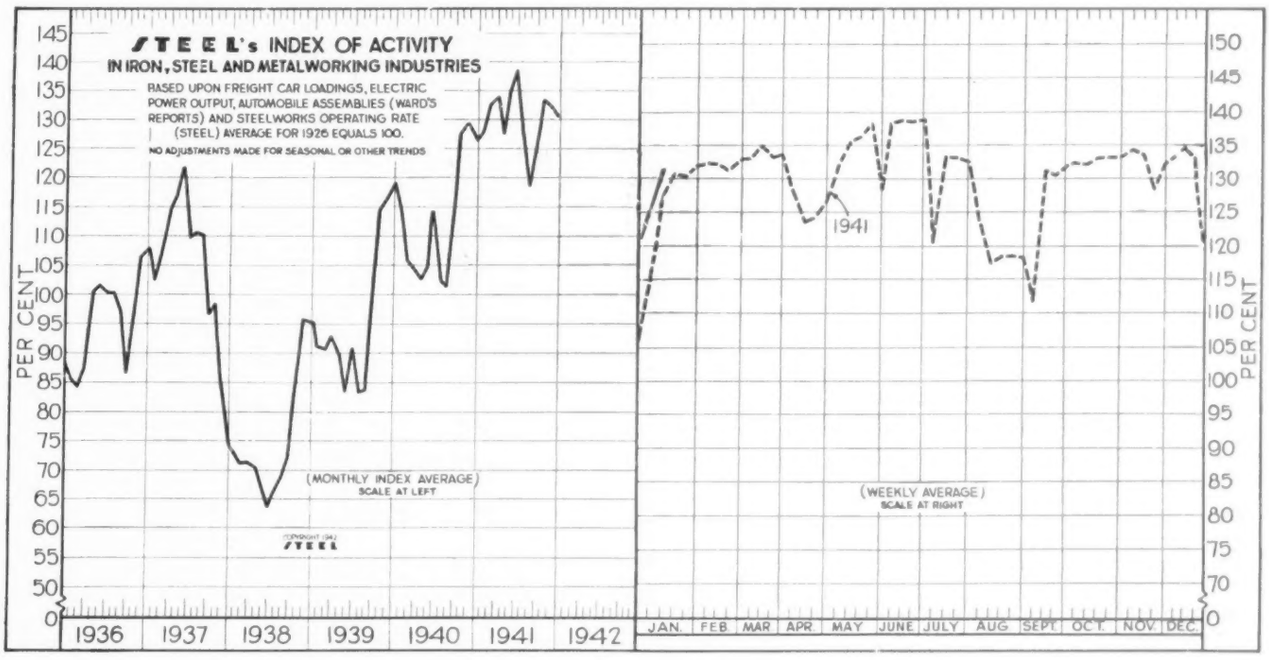
Gaining Momentum

■ THIS country's all out war effort has been given added impetus with the appointment of Donald M. Nelson to head the war production board. This is thought to be only the beginning of an immense revamping of the government's production organization.

With the advent of actual war the attempt of some to carry on the policy of business as usual was abruptly discarded. Plants producing military goods have already or are preparing to operate on a 24 hour seven day week basis wherever possible. Co-operation of government and labor with industry has been measurably improved. Strikes have now become the rare exception and ceiling prices of certain metals have been raised to increase mine output.

STEEL'S index of activity advanced 6.6 points to 131.3 during the week ended Jan. 10. A year ago the index stood at 128.2. The gain during the latest week was largely accounted for by the fact that in the preceding period the index was adversely affected by New Year's Day holiday.

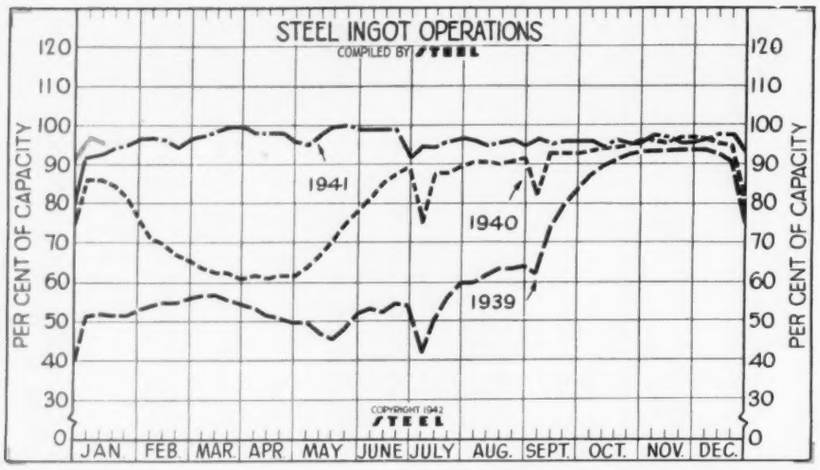
Revenue freight carloadings, electric power consumption and automobile production advanced during the latest week.


STEEL's INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100.
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
(MONTHLY INDEX AVERAGE) SCALE AT LEFT
(WEEKLY AVERAGE) SCALE AT RIGHT
1941
1936 1937 1938 1939 1940 1941 1942
JAN. FEB. MAR APR. MAY JUNE JULY AUG SEPT. OCT. NOV. DEC.

STEEL'S index of activity gained 6.6 points to 131.3 in the week ended Jan. 10:

Week Ended	1941	1940
Nov. 8	134.4	130.3
Nov. 15	133.8	130.3
Nov. 22	128.4	124.7
Nov. 29	132.2	132.6
Dec. 6	133.4	132.5
Dec. 13	134.8	132.6
Dec. 20	132.9	132.4
Dec. 27	120.5	107.5
Week Ended	**1942**	**1941**
Jan. 3	124.7	114.5
Jan. 10	131.3	128.2

Mo. Data	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
Jan.	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6
Feb.	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2
March	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4	98.6
April	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7
May	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2
June	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8
July	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9
Aug.	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4
Sept.	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7
Oct.	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8
Nov.	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0
Dec.	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3



Steel Ingot Operations

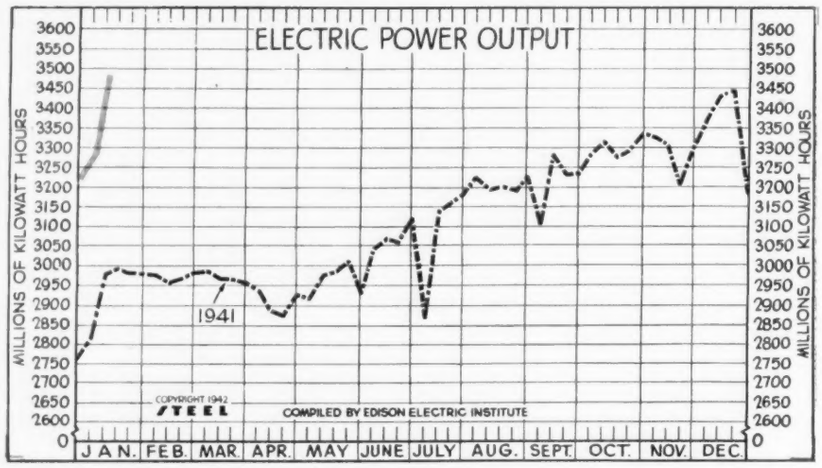
(Per Cent)

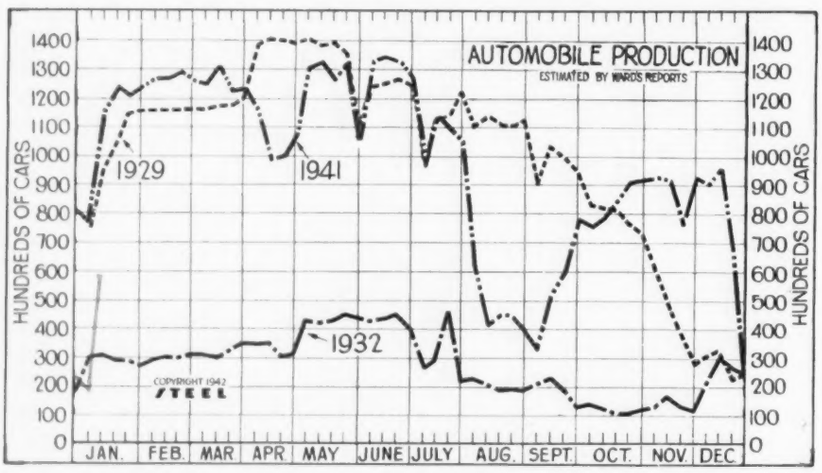
Week ended	1942	1941	1940	1939
Jan. 10....	96.5	93.0	86.0	52.0
Jan. 3....	97.5	92.5	86.5	51.5
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27....	93.5	80.0	75.5	40.0
Dec. 20....	97.5	95.0	90.5	52.0
Dec . 13....	97.1	95.5	92.5	58.0
Dec. 6....	96.5	96.5	94.0	61.0
Nov. 29....	95.0	97.0	94.0	61.0
Nov. 22....	95.5	97.0	93.5	62.0
Nov. 15....	97.0	96.0	93.5	63.0
Nov. 8....	97.5	96.5	93.0	61.5
Nov. 1....	95.5	96.5	93.0	57.5
Oct. 25....	95.5	95.5	92.0	54.5
Oct. 18....	96.5	95.0	91.0	51.5
Oct. 11....	94.5	94.5	89.5	51.5
Oct. 4....	96.0	93.5	87.5	48.5
Sept. 27....	96.0	93.0	84.0	47.0

Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
Jan. 10.....	3,480	2,985	2,688	2,329
Jan. 3.....	3,287	2,831	2,558	2,239
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27.....	3,234	2,757	2,465	2,175
Dec. 20.....	3,449	3,052	2,712	2,425
Dec. 13.....	3,431	3,004	2,674	2,390
Dec. 6.....	3,369	2,976	2,654	2,377
Nov. 29.....	3,295	2,932	2,605	2,335
Nov. 22.....	3,205	2,839	2,561	2,248
Nov. 15.....	3,304	2,890	2,587	2,325
Nov. 8.....	3,339	2,858	2,589	2,277
Nov. 1.....	3,339	2,882	2,609	2,271
Oct. 25.....	3,299	2,867	2,622	2,284
Oct. 18.....	3,273	2,838	2,576	2,281
Oct. 11.....	3,315	2,817	2,584	2,251
Oct. 4.....	3,290	2,792	2,554	2,229
Sept. 27.....	3,233	2,816	2,559	2,208


ELECTRIC POWER OUTPUT
MILLIONS OF KILOWATT HOURS
1941
COPYRIGHT 1942 STEEL
COMPILED BY EDISON ELECTRIC INSTITUTE
J A N. FEB. MAR APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.



Auto Production

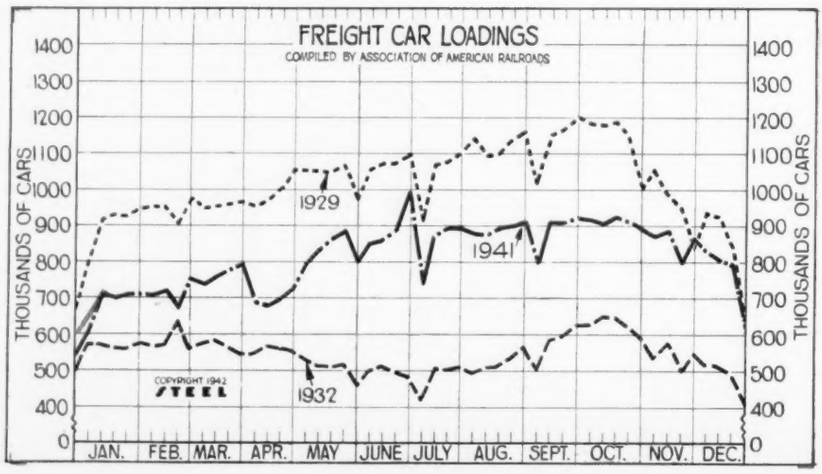
(1000 Units)

Week ended	1942	1941	1940	1939
Jan. 10....	59.0	115.9	111.3	86.9
Jan. 3....	18.5	76.7	87.5	76.7
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27....	24.6	81.3	89.4	75.2
Dec. 20....	65.9	125.4	117.7	92.9
Dec. 13....	96.0	125.6	118.4	102.9
Dec. 6....	90.2	124.8	115.5	100.7
Nov. 29....	93.5	128.8	93.6	97.8
Nov. 22....	76.8	102.3	72.5	84.9
Nov. 15....	93.0	121.9	86.7	96.7
Nov. 8....	93.6	120.9	86.2	86.3
Nov. 1....	92.9	118.1	82.7	80.0
Oct. 25....	91.9	117.1	78.2	73.3
Oct. 18....	85.6	114.7	70.1	68.4
Oct. 11....	79.1	108.0	75.9	50 5
Oct. 4....	76.8	105.2	76.1	37.7
Sept. 27....	78.5	96.0	62.8	25.4

Freight Car Loadings

(1000 Cars)

Week ended	1942	1941	1940	1939
Jan. 10.....	737	712	668	587
Jan. 3.....	674	614	592	531
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27.....	607	545	550	500
Dec. 20.....	799	700	655	574
Dec. 13.....	807	736	681	606
Dec. 6.....	833	738	687	619
Nov. 29.....	866	729	689	649
Nov. 22.....	799	733	677	562
Nov. 15.....	884	745	771	657
Nov. 8.....	874	778	786	637
Nov. 1.....	895	795	806	673
Oct. 25.....	914	838	834	709
Oct. 18.....	923	814	861	706
Oct. 11.....	904	812	845	727

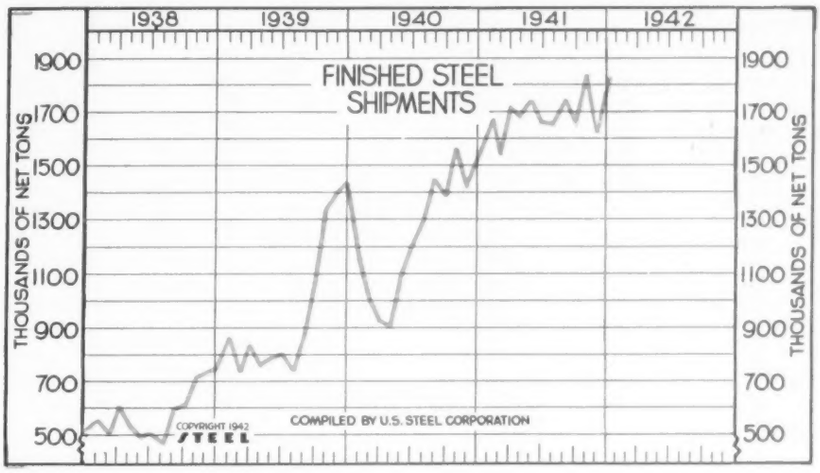


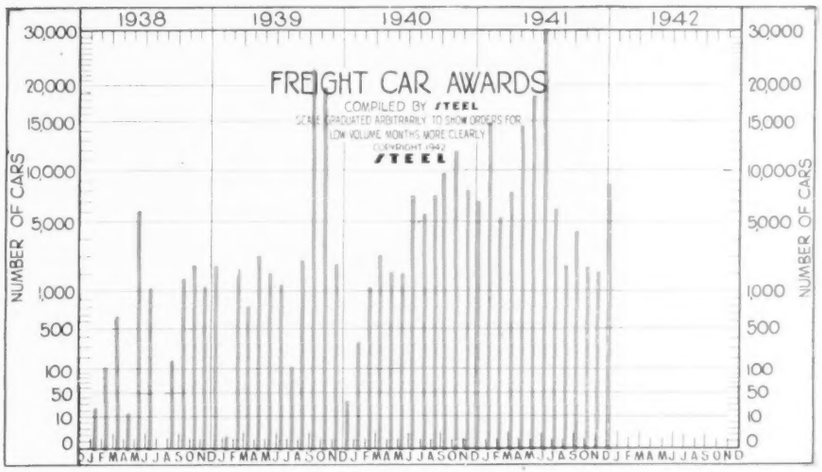
Finished Steel Shipments
U. S. Steel Corp.

(Unit 1000 Net Tons)

	1941	1940	1939	1938	1937
Jan....	1682.5	1145.6	870.9	570.3	1268.4
Feb....	1548.5	1009.3	747.4	522.4	1252.8
Mar...	1720.4	931.9	845.1	627.0	1563.1
Apr....	1687.7	907.9	771.8	550.5	1485.2
May ..	1745.3	1084.1	795.7	509.8	1443.5
June ..	1668.6	1209.7	807.6	525.0	1405.1
July...	1666.7	1296.9	745.4	484.6	1315.3
Aug. ..	1753.7	1455.6	885.6	615.5	1225.9
Sept. ..	1664.2	1392.8	1086.7	635.6	1161.1
Oct....	1851.3	1572.4	1345.9	730.3	876.0
Nov. ..	1624.2	1425.4	1406.2	749.3	648.7
Dec....	1846.0	1544.6	1444.0	765.9	539.5
Tot.†.	14976.1	11707.3	7315.5	14097.7	

†After year-end adjustments.




1938
1939
1940
1941
1942
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1942 STEEL
NUMBER OF CARS
30,000
20,000
15,000
10,000
5,000
1,000
500
100
50
10
0
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

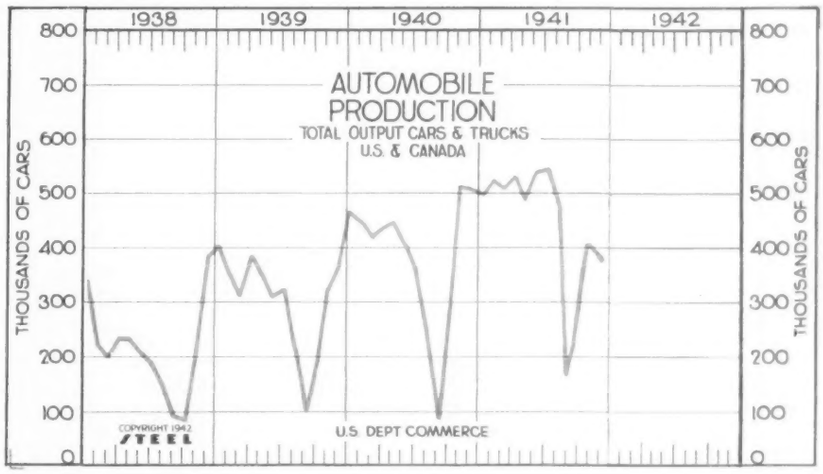
Freight Car Awards

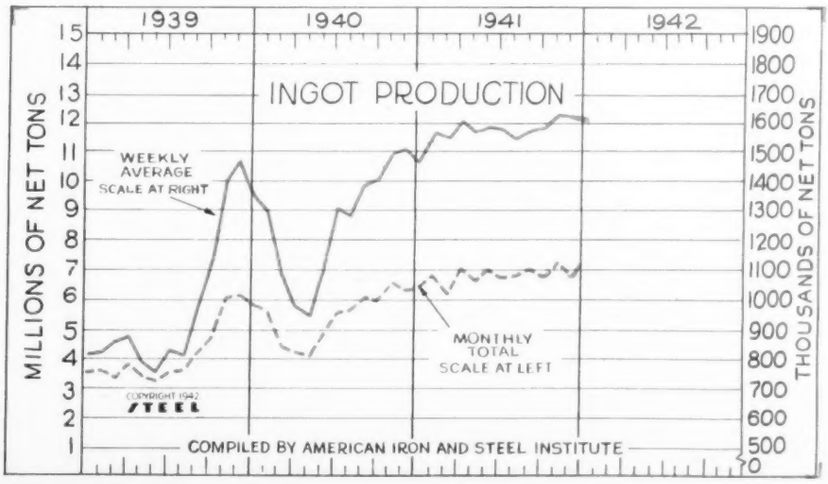
	1941	1940	1939	1938
Jan.	15,169	360	3	25
Feb.	5,508	1,147	2,259	109
March ...	8,074	3,104	800	680
April	14,645	2,077	3,095	15
May	18,630	2,010	2,051	6,014
June	32,749	7,475	1,324	1,178
July	6,459	5,846	110	0
Aug.	2,668	7,525	2,814	182
Sept.	4,470	9,735	23,000	1,750
Oct.	2,499	12,195	19,634	2,537
Nov.	2,222	8,234	2,650	1,232
Dec.	8,406	7,181	35	2,581
Total...	121,499	66,889	57,775	16,303

Automobile Production

(Unit: 1000 Cars)

	1941	1940	1939	1938	1937
Jan.	524.1	449.3	357.0	227.1	399.2
Feb.	509.3	421.8	317.5	202.6	383.9
March	533.9	440.2	389.5	238.6	519.0
April	489.8	452.4	354.3	238.1	553.4
May	545.3	412.5	313.2	210.2	540.4
June	546.3	362.6	324.2	189.4	521.1
July	468.8	246.2	218.5	150.4	456.9
Aug.	164.8	89.9	103.3	96.9	405.1
Sept.	248.8	284.6	192.7	89.6	175.6
Oct.	401.4	514.4	323.0	215.3	338.0
Nov.	373.9	511.0	370.2	390.4	376.6
Dec.	.....	506.9	469.0	407.0	346.9
Ave.	.....	391.0	311.0	221.3	418.0





Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total		Weekly Average	
	1941	1940	1941	1940
Jan.	6,928.8	5,764.7	1,563.9	1,301.3
Feb.	6,237.9	4,525.8	1,559.5	1,093.2
Mar.	7,131.6	4,389.2	1,609.9	990.8
Apr.	6,756.9	4,100.5	1,575.0	955.8
May	7,053.2	4,967.8	1,592.2	1,121.4
June	6,800.7	5,657.4	1,585.3	1,318.8
July	6,821.7	5,724.6	1,543.4	1,295.2
Aug.	7,001.0	6,186.4	1,580.4	1,396.5
Sept.	6,819.7	6,056.2	1,593.4	1,415.0
Oct.	7,242.7	6,644.5	1,634.9	1,499.9
Nov.	6,970.0	6,469.1	1,624.7	1,507.9
Dec.	7,164.0	6,495.4	1,620.8	1,469.5
Total	82,927.6	66,981.7	1,590.5	1,281.2†

†Weekly average.

Brazilian STEEL

■ AT MONLEVADE in the mining state of Minas Geraes, Brazil, is located one of the plants of the Companhia Siderurgica Belgo-Mineira. Seven years ago this site had been a jungle wilderness inhabited by few people and almost inaccessible. Today it is a thriving community built around the largest steel mill in South America, with all the means of modern transportation and communications. Here is truly a miracle of production. Ground for this great industry was broken in 1935 by the president of the republic, Getulio Vargas.

A housing plan has been completed for the laborers in the mills at Monlevade. Rows of attractive concrete bungalow-styled cottages each have their own small garden. Here the occupants enjoy the free use of water and electricity. Rentals on these houses range in price from $1.05 to $2.10 a month. In the center of this little city stands the steelworks and mills running day and night with only a stop on Sunday. The mill with its towering stacks and spotless white buildings is in an ideal setting. The surrounding hills produce the iron ore which runs as high as 68 per cent. An abundant water supply is regulated by a modern dam. Railroads haul the finished product to large Brazilian centers.

The most interesting phase about this great organization is its history. The town of Monlevade owes its name to a French engineer, Jean Antoine de Monlevade, who came to Brazil in the early part of the nineteenth century. He was born in Creuse, France. He entered the Polytechnic School of Paris, founded by Napoleon, completing his studies of engineering in 1815 and classified as second in his class. In recognition of his scholastic standing the French government awarded him a voyage for study purposes and he elected a visit to Brazil. This voyage from France to Brazil was made of course by sailing vessel. During the entire time of crossing, the sea was extremely rough and Jean Antoine de Monlevade proved to be a poor sailor. Such a disagreeable experience, lasting many weeks, caused him to lose any desire for a return-crossing to his native country and he never left Brazil.

During the first part of his life in Brazil, Jean Antoine de Monlevade came into close contact with a German metallurgist, the Baron Von Eschwege, who had been contracted by Dom Joao VI, king of Portugal (at the time Brazil was still a Portuguese colony) in order to implant the iron industry in this country. Among several other enterprises, he worked with Eschwege in the installation of Catalan forges in the neighborhood of Congonhas do Compo, a small town located in the then Province of Minas Geraes. In 1817 he severed business relations with Von Eschwege for the purpose of following metallurgy on his own account. With this in mind he built a blast furnace in the surroundings of Caete, a town situated further in the interior of Minas Geraes.

Nevertheless, for reasons which are not yet well known, this blast furnace did not give the desired results. In 1818 he abandoned this installation and journeyed further into the interior of the Province, stop-

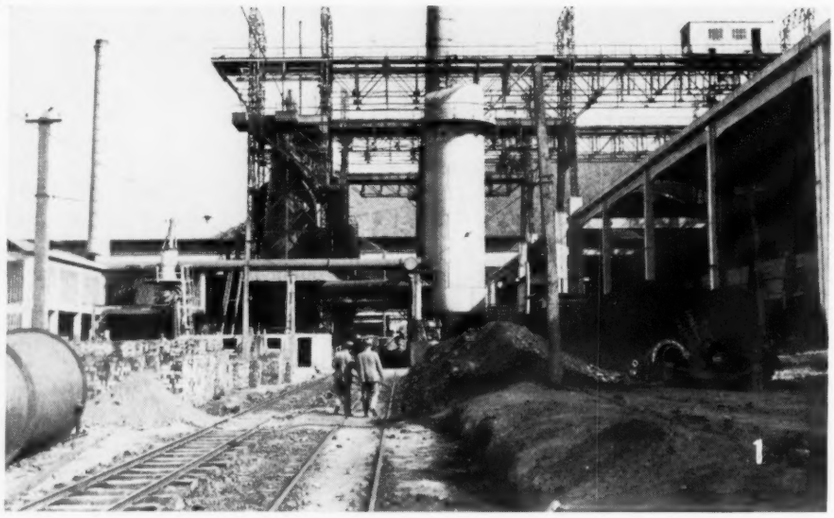


Fig. 1—Looking toward the blast furnace. Switching of ladles is done by electric locomotive

Plant Equipment and Output

SABARA WORKS

	Number	Annual Output, tons
Blast furnaces	2	36,000
Open hearths, basic	3	36,000
Merchant mill	1	36,000

MONLEVADE WORKS

Blast furnaces	2	50,000
Open hearths, 35-ton	2	55,000
Blooming mill, 38"	1	.....
Rod mill	1	.....
Wire mill	1	30,000
Under Construction:		
Blast furnaces, 85-ton	2	.....
Open hearths, 35-ton	2	55,000

On Order in United States:

Structural mill for rolling 40 to 100-pound rails and 3 to 15-inch sections.
Two additional blast furnaces.
Two additional open-hearth furnaces.

TOTAL FUTURE OUTPUT

Commodity	Monlevade Works, tons	Sabara Works, tons
Rails	50,000	.....
Wire, galvanized & barbed	50,000	.....
Rounds, plates & structural	26,000	.....
Pipe, galvanized	24,000	.....
Merchant shapes	.....	40,000
Total	150,000	40,000

From an article in *Brazilian Business*, Sept. 1941. The author, a student at Dartmouth college, recently visited the Monlevade plant and his article is timely in view of plans of the Brazilian government to build its plant at Volta Redonda in the state of Rio de Janeiro.

By JAMES H. DRUMM JR.

PLANT

Operates on

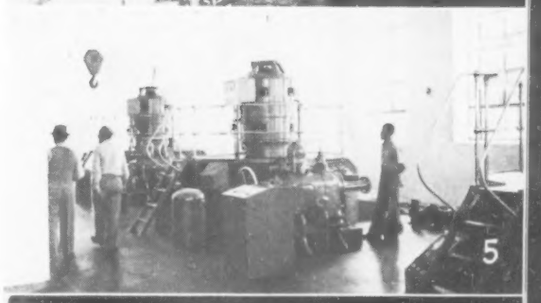
FORMER JUNGLE SITE

ping at a place situated on the left bank of the river Piracicaba, somewhat up-stream of the juncture of this river with the Rio Santa-Barbara. The locality he chose for this new enterprise was an estate owned by the Province of Minas Geraes and which he later acquired from the Provincial Government for his own account. He gave up the idea of making iron by means of blast furnace and instead introduced the process of fabricating malleable iron with Catalan furnaces. Slowly he was able to train several slaves, imported from Africa, and was successful in teaching them to become good foundry men, blacksmiths, carpenters and with a better type of workmanship he was in a position to increase constantly the installations of his ironworks. At this time, the forges of Monlevade, which were the most important of the region, produced 595 pounds of iron daily. This iron was used mostly for the fabrication of tools for agriculture and implements for the extraction of gold.

His son, Jean de Monlevade, after his father's death, continued in the same branch of industry and in 1888, founded with others a society for the exploitation of the iron industry with more modern methods known as "Companhia Nacional de Forjas e Estaleiros." All the necessary machines, water turbines, rolling mills, steam hammers, machine tools, were purchased in the United States and England and transported to Monlevade by boats and oxcarts.

Owing to reverses, the society

(*Please turn to Page* 83)



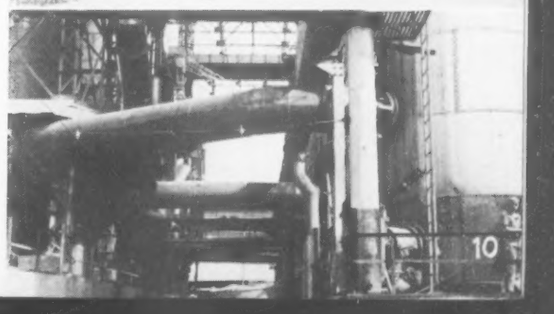


Fig. 2—Portion of the steel plant building which is being extended to house new structural mill of Yankee design

Fig. 3—View of plant from Monlevade old home showing blast furnace at right

Fig. 4—Dam which supplies sufficient water to operate hydroelectric equipment in the power house

Fig. 5—Two hydroelectric generators in the power house

Fig. 6—Laborers cutting into the side of a mountain of iron ore nearby the plant. Roads are built of rock forked from the ore

Fig. 7—Iron ore deposits in the region around Monlevade in the mining state of Minas Geraes, Brazil

Fig. 8—Charcoal, the blast furnace fuel, is transported to the furnace in baskets by mules as shown in illustration

Fig. 9—Modern dwellings of the bungalow type are provided for the employes

Fig. 10—Blast furnace view taken from cinder track. Slag ladles in foreground, hot blast stoves at right

Quality Control in

BOMB FUZE MANUFACTURE

. . . . centers around setting and control of dimensional tolerances

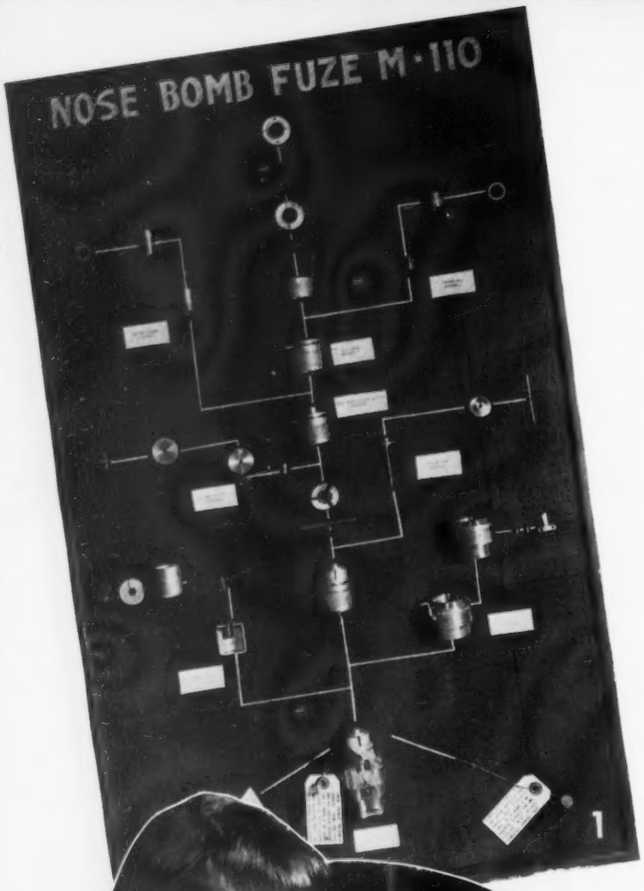


Fig. 1—M-110 Fuze. This panel shows all parts and subassemblies of the fuze progressing downward from the top and ending with the (cutaway) complete fuze at the bottom

Fig. 2—Ball Loading Device. Balls from hopper fill tube to the first stop at all times. When assembly of inner race, hub, etc., is put in place as shown, horizontal bar at bottom is pushed back, rocking the hopper, opening and again closing the upper stop. This permits the length of tube between the two stops to fill, counting out the required 28 balls. Pressing the lower stop permits the balls to run down the tube into the race, which is covered by a transparent disk which keeps the balls in place but permits observation by the operator

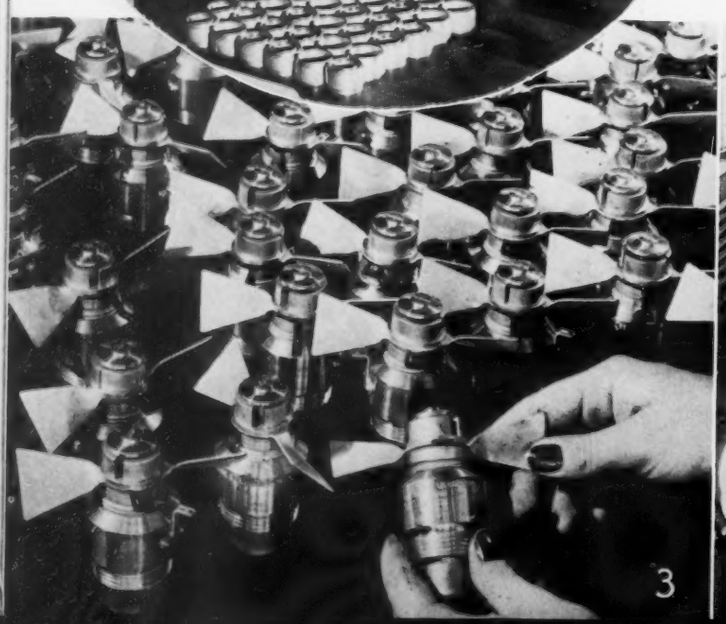


Fig. 3—Bomb Fuzes. Propellers on these fuzes permit safe handling until bomb is dropped from plane. Then they spin off the safety mechanism and allow bomb to explode on impact. Production has doubled recently in the Westinghouse East Springfield works

Fig. 4—Assembly Line. Assembly progresses from first subassemblies in foreground to final test at far end of bench, subassemblies being moved between positions in the open troughs. Finished fuzes are checked by the Army inspectors on the cross bench at the far end, where they are also staked and where the safety wire is assembled and sealed. They are then packed in cartons on another bench at the right (not shown)

By A. L. ATHERTON
Manager, Quality Control
Westinghouse Electric & Mfg. Co.
East Springfield, Mass.

■ THE FIRST ordnance item manufactured in quantities by the East Springfield Works of Westinghouse Electric & Mfg. Co., the M-110 bomb fuze, has disclosed some features of general interest in manufacturing practices, control of quality, and relations with the various Army organizations. This fuze includes a timing device, the purpose of which is to render the bomb safe until it has been dropped from the plane and fallen approximately 500 feet. This kind of safety feature is required to prevent injury to the plane if the bombs are dropped when the plane is too low, or when it is desired to "drop the bombs safe", as well as when the plane is to be landed while carrying bombs.

The fuze consists of the usual firing pin, detonating caps and pellets, and a safety device to prevent detonation except when intended. For articles on fuze developments and production, see STEEL, June 2, 1941, p. 52; June 9, 1941, p. 58; June 16, 1941, p. 56. The safety device consists of "safety blocks" interposed between the striker plate and the body of the fuze so that even normal impact will not cause detonation unless the safety blocks are removed. When it is desired that the bomb shall be "armed" so it will detonate on impact, provision is made for removing the safety blocks by means of a gear train driven by a propeller or "vane" in the 3 or 4 seconds required for the bomb to fall a desired 500 feet or so.

The fuze consists largely of screw machine parts of steel, aluminum and brass, together with two small gears, a pinion and a few punch press parts.

Drawings prepared by the Army engineers specify material, dimensions and tolerances in the normal fashion. Preliminary study of the design at Westinghouse and experience during early production disclosed the need for dimensional control of some of the parts within the specified tolerances in order to secure proper operation without selective assembly, a not uncommon condition with all products. The contract calls for meeting the detailed specifications and also for producing assembled fuzes which will pass the required final test. If to secure proper operation, parts dimensions must be controlled closer than the tolerances specified on parts drawings, such control is part of the contract obligation.

Since we had been advised during negotiation that this was a new design which had never been manufactured in quantities before, it was recognized at the outset that the development of the design for quantity production, the establishment of practicable tolerances and controls and the rest of the growing pains which are a part of putting a new product into manufacture, would be our problem. Hence attention was focussed on these problems at the outset.

The use of the principles of "statistical methods applied to control of quality" (*Economic Control of Quality of Manufactured Product*, Shewhart, Van Nostrand, 1931; *Statistical Method from the Viewpoint of Quality Control*, Shewhart & Deming, Department of Agriculture, 1939) was the device on which major dependence for settlement of these problems was placed. This system is well illustrated by the following example:

A gear hub (a portion of this fuze assembly) has an external bearing surface 0.6775-inch in diameter which must fit the part in which it is assembled with sufficient freedom to insure rotation under the low torque delivered by the vane, but without much side play. Experience shows that the drawing tolerance of 0.005-inch gives satisfactory results. As the finished parts come off the screw machine, periodic samples are taken, the dimension in question is determined for each piece and plotted on a chart. Average values and the deviations of the individual dimensions from this average are calculated for each sample. Study of these and similar data for the mating piece discloses average as well as minimum and maximum clearance between parts and indicates immediately (1) whether the fits will always be satisfactory, (2) whether the setting of the machine should be changed, (3) whether the method and equipment are such as to produce pieces closely enough alike to give satisfactory results and (4) what percentage of parts so made can be expected to give unsatisfactory assemblies which will require dismantling.

In order that the setup may be safely approved before many parts

Fig. 5—Check of Concentricity of Arming Sleeve and Gear. Assembly of sleeve and gear is mounted on the staging fixture of the comparator, its shadow enlarged 62.5 times. Gear size and tooth contour are compared with the prepared chart. Rotating the piece shows run out, enlarged

Fig. 6—Final Test. Completed fuze, less vane and before final staking of body, is mounted in the fixture shown. Upper member of fixture is slid down over top of fuze. Air jet from a regulated and measured source is directed through the movable nozzle to one side of the air impulse turbine wheel, rotating the top of the fuze the required 70 turns. The nozzle is then moved against the other stop and the operation is reversed. Revolutions are counted by the segmental worm wheel shown just under the fan. Nozzle and fan design and air pressure are so chosen as to give normal operation for acceptable fuzes but to fail to turn fuzes with excessive friction

are produced, four times as many samples are taken initially as taken in production. Necessary corrections in setup are, of course, made before production in quantities is begun.

In the gear hub example, the initial sample of 24 parts had an average diameter of about 0.6772-inch, a reasonable variation from the nominal dimension. Production was therefore continued, and samples of six parts (one from each spindle of the machine) were collected thereafter at intervals of about an hour and a half. The time interval was originally set so as to roughly balance the cost of defective parts against the cost of inspection.

Both the average and range of sample measurements fell within their statistical limits, up to the sample which was collected at 11:40 a.m. on Aug. 19, 1941. In this sample, the range of measurements slightly exceeded the limit, and the inspector in charge went to the machine to investigate the cause. This was found to be a slightly dull tool coupled with the possibility of hard spots in the stock; it was decided to run the machine a little longer.

The next sample, collected at 12:30 p.m., indicated that the average dimension being produced had changed (since the average measurement of the sample lay above the upper limit) and it was found that the tool had slipped in the holder. At that time, the tool was ground and reset, following which another sample of 24 parts was taken and a new chart started.

It will be seen that this approach automatically verifies or modifies the drawing tolerances in accordance with the dictates of practical experience. In some cases, experience showed the need for maintaining closer tolerances than those given on the drawing; in others, it was found that no disadvantage resulted from some increase in tolerances. However, if we were to take advantage of the possibilities of increased tolerances which experience indicated as permissible, we would not be meeting the terms of the contract, and such steps were taken only with the sanction of engineers of the Army Ordnance Division.

Use of the statistical method to control parts dimensions makes it possible to avoid 100 per cent inspection operations, or sorting, for practically all pieces. With this method, we can accurately predict whether any pieces of a given lot will fall outside the pre-established limits and if so, what percentage. Whether any pieces outside the specified limits are permissible, depends on the circumstances surrounding a particular case. Each piece has been studied from this viewpoint to establish the proper practice. The pieces, or individual dimensions on the pieces, divide themselves naturally into four broad classifications as follows:

First, important parts or dimensions, for which no subsequent check is available. Whenever a dimension or part is vital to the proper functioning of the completed device and subsequent quality checks will not determine the correctness of the piece, every effort must be made to detect defective pieces at the source and prevent their use. In these cases, 100 per cent inspection is required, and it should preferably be of such a type as to minimize the possibility of human element error.

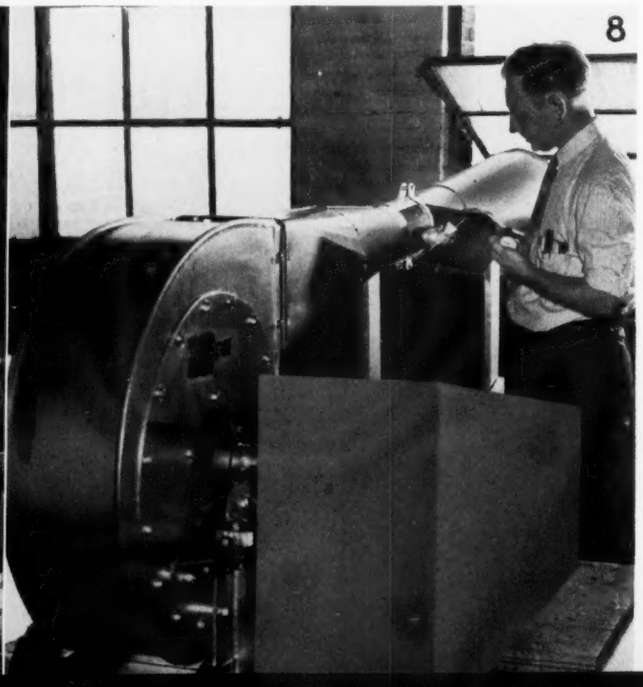
Second, important dimensions or parts, errors in which will not be detected by subsequent operations here but which will definitely be detected by later operations prior to use. In cases of this sort, the shipment of incorrect parts involves inconvenience and expense but does not involve inoperative equipment in the field. Defective pieces used must be held to a minimum, but the importance is clearly not so great as in the first case. A limiting percentage of defects has been tentatively set at 1 per cent and the actual percentage is materially less than this.

Third, important dimensions, errors which will be detected during our assembly operations or later quality checks. Here the disadvantage of sending to the assembly section parts which fall outside the acceptable tolerance limits is purely economic. The defective pieces will not find their way into the completed product. In these cases, the percentage of defects which is tolerable is determined by economic calculation for each piece and, generally speaking, it falls into the vicinity of 2 to 3 per cent. Holding the percentage lower increases the cost of inspection in the machining division more than is justified by the saving in the assembly operation.

Fourth, unimportant dimensions. When a surface "fits the air", no

Fig. 7—Parts Checking. All critical dimensions are checked for control of manufacture and to insure quality of the product. Here the aluminum body is being measured for thickness of the web which determines the axial positions of the inner ball race and of the booster cup, both of which affected operation critically

Fig. 8—Wind Tunnel. Fuze is mounted in a supporting bracket on hinged door of tunnel. When door is closed, fuze is in air stream, the velocity of which has been previously established. With the air stream flowing, the wire which blocks the vane is removed and the time to throw the safety blocks is recorded. Supporting bracket is so arranged as to permit the fuze in the air stream to oscillate to simulate the swing of the fuzed bomb as it leaves the plane



real harm results from failure to meet the specified dimensions. Here, the percentage of parts which can properly be used, even though outside of the drawing tolerance, is merely a matter of what we mean by "the standards of good workmanship". Here a total of 5 per cent defects, if they are not extreme, is not unreasonable.

This whole approach to the problem of quality control is, in the last analysis, merely the application of the general commercial principle of directing major attention to the more important dimensions. It results not only in economy of manufacture but elimination of a vast amount of unnecessary labor and a certain amount of scrap without sacrifice of usefulness of the product. The co-operative working out of this program by Hartford Ordnance and Westinghouse constitutes a step of real importance in the war products program.

On occasion, we have furnished parts for assembly at other plants. In these cases, the penalty for defects is much greater than when we assemble the fuzes ourselves, and the percentage of defects which can be tolerated is much less.

Early in our assembly experience, difficulty was encountered with an intolerable percentage of finished fuzes which failed to pass the specified commercial test because of a tendency of two cadmium plated surfaces which operate together with relatively small clearance to stick, roll up a small ball of cadmium and lock themselves securely together. At first this was felt to be caused by incorrect plating technique. Much work was done from this angle to eliminate these rejects, but without success.

Then it was recognized that this was probably another of those problems which are encountered only when quantity manufacture is begun and that what was really needed was actual experience under normal operating conditions. Working with the Army Ordnance Division engineers, a twofold program was initiated; First, we set up a miniature wind tunnel to provide air velocities of up to 250 miles per hour in which the fuzes could be operated and, second, several lots of sample fuzes of various designs and construction were furnished the Army, loaded and dropped from planes as in service. Various minor defects were disclosed by these tests and corrected so that the present product with improvement, contributed by the Army engineers and Westinghouse and jointly, is not only dependably operative but is satisfactory to manufacture.

This kind of joint program which makes use of the knowledge, skill, and resources of both Army engineers and the contracting manufacturer is a good example of the 1942 model of industry's part in providing ordnance items for war.

Fig. 9—High Speed War Production. This automatic machine performs six operations in 14 seconds on parts for bomb fuzes; has helped double production

Establishes Fellowships For Welding Research

■ Three fellowships—one at Lehigh university, one at Columbia university and another at Carnegie Institute of Technology were recently established this year by the structural steel committee of the Welding Research Committee, Engineering Foundation, for carrying out researches relative to the use of welding in structural work of buildings and bridges. These were started as of Oct. 1, 1941, according to the American Institute of Steel Construction.

The investigation at Lehigh is organized for beam-to-girder and beam-to-column connections of flexible, semirigid and rigid types of building construction. That at Columbia of the efficiency of butt joints with through-plate stiffeners has progressed to the completion of physical tests on beams and supplementary specimens. The equipment required for impact tests to determine the value of butt welds for splicing H-sections has been installed here, and tests are now being carried out. At Carnegie the program will cover the capacity of load-bearing welded plate stiffeners for plate girders compared with riveted-angle stiffeners.

The work of the structural steel committee is a continuation of the old structural steel welding research committee of the American Bureau of Welding.

Schedules Conference On Enameled Utensils

■ A general conference on multiple-coated porcelain enameled-on-steel utensils will be held at the Blackstone hotel, Chicago, Jan. 29, according to the National Bureau of Standards, United States Department of Commerce, Washington. Scheduled to begin at 10 a. m., the meeting will involve discussion of proposed standard TS-3176, recently prepared by the bureau upon request of the Enameled Utensil Manufacturers Council.

All those interested are invited to be present at the conference in order that the standard may be adjusted as far as practicable. Names of individuals who are to attend the meeting should be sent to I. J. Fairchild, chief, division of trade standards.

Technical Progress

PACES VICTORY MARCH

(Additional comments that could not be included in the Jan. 5 issue)

Developments in Magnesium Production

By R. S. DEAN
Chief, Metallurgical Division
Bureau of Mines
U. S. Department of the Interior
Salt Lake City, Utah

■ IN ANY military emergency, new developments that might take years to reach commercial establishment are pushed forward rapidly. In the present period, magnesium production has perhaps advanced more speedily than that of any other metal.

The greatest innovation has been electrothermal production started on a grand scale by the Henry Kaiser interests, using the Hansgirg process in which the magnesium volatilized from a mixture of magnesium oxide and carbon in an electric arc is condensed by a blast of natural gas and then resublimed.

A substantial pilot plant uses a modification of the oil-condensation method developed by the Bureau of Mines. Other plants propose to use variation of chloride electrolysis long employed in this country by Dow as the sole source of magnesium. The problem of the best raw material source for any of these processes is rapidly coming to the fore, and much research is being done in this direction. Currently beneficiated magnesite and magnesium oxide precipitated from seawater or brines have the inside track, but chemical treatments of suitably located impure magnesites and dolomites seem likely to win out in the long run.

In the aluminum industry, it appears likely that alumina made by acid processes from western alunites and clays may at last get a trial at western aluminum plants in competition with bauxite purified by the Bayer process.

Domestic manganese production is receiving some belated consideration. The Anaconda flotation plant is producing a substantial quantity of high-grade sinter, and the small plant of the Electro Manganese Corp. at Knoxville continues to produce electrolytic manganese. The possibilities of electrolytic manganese as a substitute for nickel and even for copper in many nonferrous alloys are becoming increasingly evident, but more electrolytic manganese is needed at a lower cost, which would certainly be possible with a larger plant. The Bureau of Mines' pilot plants at Boulder City are producing sinter by milling and by hydrometallurgy, as well as electrolytic manganese from western ores. These plants will indicate beyond a doubt what can be done in these fields.

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Trend Toward Larger Blast Furnaces

By B. J. HARLAN
Superintendent
Blast Furnaces
Lackawanna Plant
Bethlehem Steel Co.

■ MOST blast furnaces in this country operated at capacity during 1941, with tonnage being the primary consideration. Several furnaces made records in excess of 40,000 net tons of pig iron per month. Production of flue dust and fuel consumption, therefore, have been somewhat higher than normally. The present trend in blast furnace construction seems to be toward furnaces 100 to 105 feet high with hearths 26 feet to 27 feet 3 inches in diameter.

At least three plants have installed blast air conditioning since 1939. Substantial results in increased tonnage and decreased fuel have been obtained. The amount of gain varies with the humidity of the air for the district in which the plant is located.

More sinter was produced in the United States than ever before. A shortage of suitable open-hearth charge ore diverted a proportion of sinter to open-hearth use, with excellent results in the open-hearth furnaces and a deleterious effect on blast furnace practice. Several large sintering plants have been built or are in the process of construction.

Three types of primary gas scrubbers have been developed which clean primary gas to 0.04 or less grains of dust per cubic foot at no additional cleaning cost. Probably the best fields for further increase in blast furnace production and decreased fuel are the blending and cleaning of coals to improve coke quality and the extension of blast conditioning.

New Heat Treatment Improves Stainless

By G. K. HERZOG
Electro Metallurgical Co.
New York

■ THE excellent progress made in 1941 in the engineering design and use of stainless steel for aircraft was largely the result of metallurgical investigation which produced a heat treatment that substantially improves the elastic properties of cold-rolled chromium-nickel austenitic stainless steel. This low-temperature heat treatment developed by Union Carbide & Carbon Research Laboratories Inc., has greatly increased the serviceability of these steels for aircraft structures. The treatment consists in holding the stainless steel for a suitable period of time in the temperature range from 392 to 572 degrees Fahr. In addition to increasing the modulus of elasticity, the treatment improves the proportional limit, yield strength, toughness and fatigue resistance.

An important technical advance has been the development of a simplified method for making compressive-strength determinations on cold-rolled stainless steel sheet. Such determinations now permit metallurgists and aircraft designers to better appraise the wide range of mechanical properties that can be obtained in the chromium-nickel steels.

These determinations have emphasized the great importance of the effect of composition as well as suitable heat treatment. The end result is that it now is possible to specify an 18-8 stainless steel which when properly heat treated has tensile, compressive and yield properties superior to those previously obtainable.

Fabricators of chemical equipment are using increasing amounts of a suitably heat-treated straight-chro-

(*Please turn to Page* 77)

Birthplace of Battleships Guns and Tanks

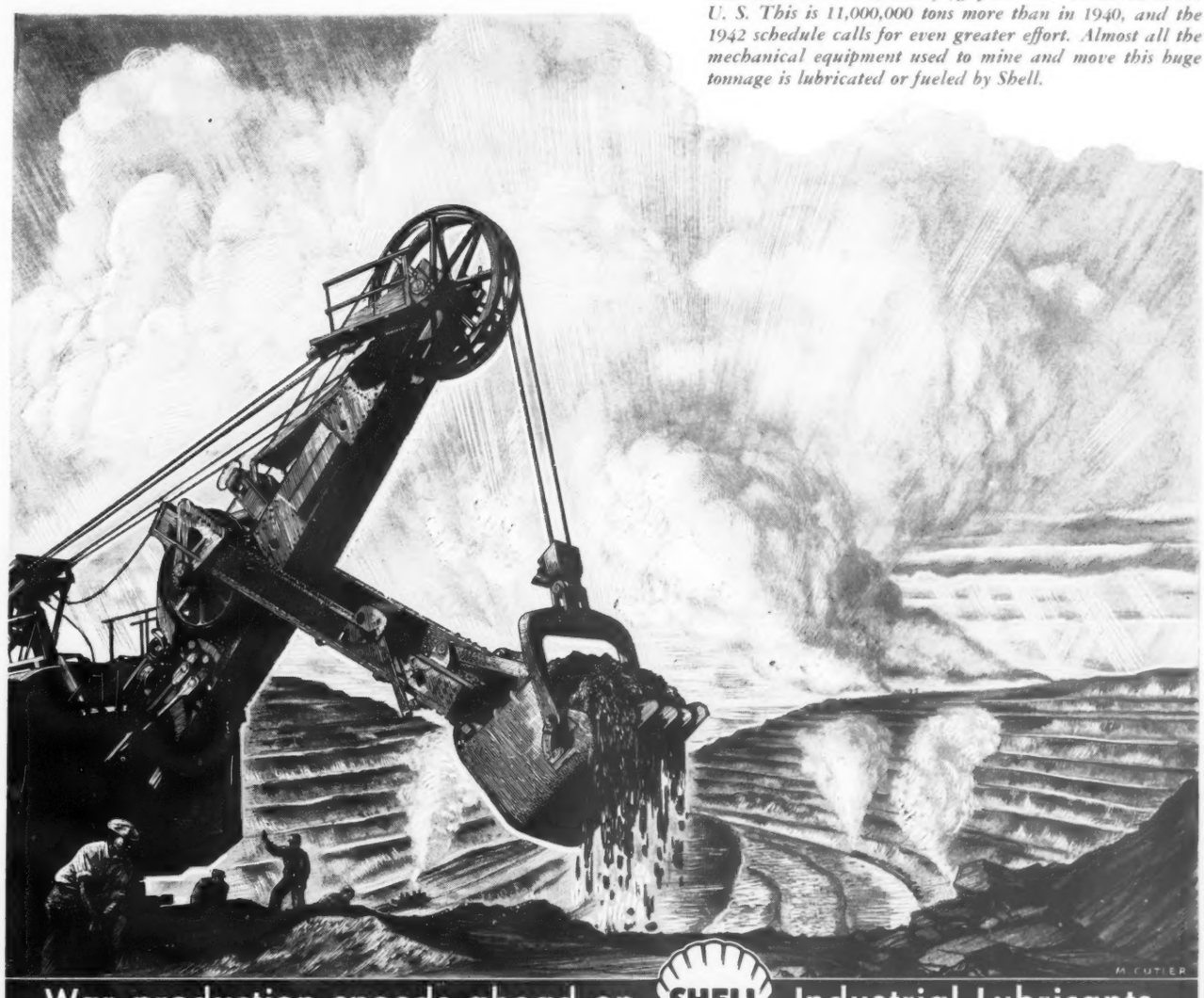
World's largest iron mine operated by Shell-Lubricated equipment

GREATEST SINGLE SOURCE of raw material for war production is the huge deposit of iron ore at Minnesota's Mesabi Range. More than 60,000,000 tons of ore were taken from this mammoth range in 1941, and this year's production will be even larger.

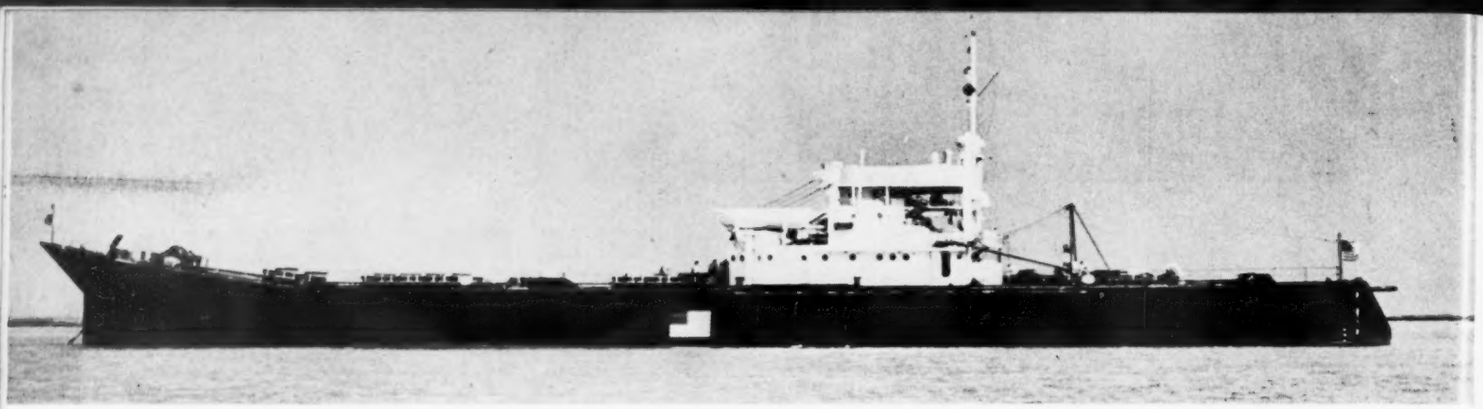
The fact that almost every shovel, tractor, truck and train on the Mesabi Range is lubricated or fueled by Shell offers unusual proof of Shell's ability to handle the toughest lubrication problems. Nevertheless, Shell oils and greases are constantly being improved to meet the ever more exacting demands of full-time production schedules. The Shell lubricants in use today are the result of constantly advancing technical research and development . . . are giving dependable service under conditions only a year ago considered impossible to solve.

Is your equipment getting this kind of up-to-the-minute lubrication? Call Shell and be sure. No matter what your lubrication problems may be, you will find Shell can be very definitely helpful in increasing the speed and quality of your production.

1941 output of iron ore at Mesabi Range *totalled more than 60,000,000 tons, nearly ⅔ of all iron ore mined in the U. S. This is 11,000,000 tons more than in 1940, and the 1942 schedule calls for even greater effort. Almost all the mechanical equipment used to mine and move this huge tonnage is lubricated or fueled by Shell.*



War production speeds ahead on SHELL Industrial Lubricants



WELDED "SEA OTTER II"

. . . . a unique cargo ship with features that appear extremely valuable as a means of meeting submarine menace. Subs can hit it only with great difficulty

■ UNUSUAL construction of the SEA OTTER II, novel experimental cargo carrier developed by the United States Navy Department as a possible answer to the submarine threat, represents an attempt to reduce shipbuilding to real quantity production by great simplification of the hull design and by use of arc welding to speed fabrication of the hull and other steel parts. Tests were so successful that the Navy Department has formed a corporation to build this type of vessel exclusively.

Although details of the ship and plans for utilization of a fleet of them if further tests prove successful are clouded in secrecy, some extremely interesting things are known about the SEA OTTER II. Originally, it was intended that the ships should have no permanent hatches in the hull whatsoever to provide for admission and removal of the cargo. It was proposed that a new type of simple hatch cover was to be securely arc welded in place after the boat was loaded and subsequently cut off without danger to the cargo when it was desired to unload the boat. It could be rewelded in place as needed.

Use Permanent Hatches

But the ship test proved so successful that it was decided to use the ships on round trips and the SEA OTTER II and all future ships of this design will have permanent natches. They will not be of the conventional type, however, as a radical departure in hatches is reported.

The ship's 16 gasoline engines also will be left permanently in the ship, rather than taking them out and dismantling the ship as had been first suggested. These changes all were made because of the extraordinarily good results obtained in test runs.

The first SEA OTTER II was constructed by the Levingston Shipbuilding Co., Port Orange, Tex. It has a length of 250 feet, beam of 40 feet and depth of 21 feet, is all-welded, employing plates from universal rolling mills. No bending or rolling is required in fabricating the steel except at the bilges. The simplicity of the welded design permitted launching of the vessel in six weeks time at a cost of $250,000. It is expected that this production time may be reduced still further if more ships are built. Produced in quantity, cost should not be more than $150,000 apiece, fully fitted out.

Subs Can't Hit It

The main hull plates are of ¾-inch steel and the flat keel is constructed of ½-inch plates. The bottom, side and deck plates are stiffened with longitudinal stiffeners. There are no transverse ribs or frames except intercoastals, which are used to stiffen the longitudinals every 10 feet. Nine transverse watertight bulkheads were welded inside the hull.

All of the welding equipment used was supplied by Lincoln Electric Co., Cleveland.

The draft of the ship is only 11 feet fully loaded.

It is thought this low draft, plus the fact that the SEA OTTER sets relatively low on the water and is far less visible than other types of cargo carriers, will make the ship a poor target for a submarine. It is well known that a torpedo must be set at a depth which insures its run being free of wave effect, which is considerably more than 11 feet for ocean going work.

The vessel in loaded condition is so low in the water that in heavy weather at sea her decks will be awash most of the time. Welded construction enables the craft to withstand this strain, plus the shock of possible near-hits, better than other types of construction because welded plates only buckle rather than split at the seams, it is claimed.

The ship is propelled by 16 automobile engines, each rated 110 horsepower. These are arranged radially in groups of four and coupled hydraulically, four to a propeller. The four propeller shafts descend vertically into the water in much the same manner as outboard motors, except that the transmissions are inside of cylindrical wells. However, the propellers of the SEA OTTER II are located just aft of amidships. The motors and propellers may be lifted up into the vessel for repairs while under way. Spare propellers and engines will be carried. The ship is equipped with degaussing equipment for protection against magnetic mines.

The ship has a cruising radius of 7000 to 9000 nautical miles and a sustained speed of 12 knots. For short cruises, however, the vessel has subdivided tanks to carry 95 tons of fuel and will have a cruising range of 3700 miles at 12 knots. She has a hold capacity of 122,800 cubic feet.

Large numbers of the ships built in quantity production may be helpful in breaking entirely Hitler's blockade of the British Isles.

Develops Product for Marking Heated Metals

■ To provide a simple and convenient method of signalling desired preheating temperatures of metals, Tempil Corp., 132 West Twenty-second street, New York, announces a new convenient form of its product, called Tempilstik°. It is offered for melting points ranging from 125 to 1600 degrees Fahr. in convenient temperature intervals, and is said to have a mean accuracy of within 1 per cent of the temperature stamped on each stick.

Thus a 300-degree stick drawn across a surface heated to less than 300 degrees Fahr. will leave a chalk-like mark which melts sharply into a liquid streak when the temperature hits the 300-degree mark.

The new product is said to offer a means of leaving a temperature signal mark on less accessible places such as vertical, inclined and overhead surfaces, and will yield up to 1000 determinations.

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Porter Diesel Electric Locomotives are *proving by performance* that they are tops on the toughest haulage jobs. Heavy welded steel trucks and main frames, and modern rugged construction throughout assure users of maximum operating and maintenance economy per ton moved.

Get the full story on the Modern Porter Diesel Electric Locomotives. Porter Diesels are built in a range of sizes from 25 tons to 80 tons. (Illustrated above is a typical 65 ton double power plant unit).

Before you consider a locomotive let Porter Engineers recommend the size and type that will best suit your particular hauling job.

PORTER "better built" locomotives

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PITTSBURGH, PENNSYLVANIA

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Panning "Pay Dirt"

From Your Factory Floor

■ TODAY when conservation of materials is so important, practices employed by reclamation department of Caterpillar Tractor Co., Peoria, Ill., offer some important possibilities, many of which could be adopted to advantage in almost any plant. Reclamation is handled by a department organized four years ago to concentrate its full time on every possibility in reclaiming and utilizing waste to the fullest extent. More than 50 employes work full time on reclamation. Everybody in the plant is convinced of the potentialities for savings in reclamation work.

Equipment utilized in reclamation operations includes a briquetting machine, scrap steel bailer, hacksaw blade grinder, woodworking machine, ripsaw, cutoff saw, alligator shear, punch press and squaring shear.

Activities of the reclamation department are centered at several points throughout the huge Caterpillar plant. Material handled includes steel clippings, crop ends and trim, aluminum borings, steel turnings, gray iron borings, used machinery, tools, obsolete jigs and fixtures, cables, screws, grinding wheels, files, paint pails, hand pads, building material, crates, lumber, wood scrap, corrugated paper, even discarded advertising literature.

The proper flow of scrap to the reclamation division comes only when each and every individual in the plant realizes the mutual benefits. This realization has been achieved here by demonstrating the practicability of reclamation methods by installing in every department a reclamation expert who knows exactly what is going on and who understands tool and material requirements.

Essentially the chief function of the reclamation department concerns disposal of all questionable nonproductive material. Reclamation can scrap, destroy, sell, give away or prepare material for re-use. Chief problem is: "Can this item be used in its present condition or with economical modifications either for any product or in maintenance work?" Other questions include: "Would it be more valuable if sold as scrap? . . . Will it save time, money and space to destroy it?"

Thus it is an important part of reclamation work to determine quickly whether the cost of reclaiming an item is more than the item will be worth.

If the item happens to be of wood and not economical to save, the reclamation department places it on a kindling pile for employes from which last year 150 loads per month of kindling were hauled away by employes.

Tool reclamation is the parent activity. To the tool reclamation crib are sent discarded tools, grinding wheels, jigs and fixtures which have been worn out, become broken or obsolete either through use or engineering changes.

Drills, reamers, broach bars and sections, milling cutters and form tools are carefully inspected and compared with a complete cross-file

Fig. 1. (Left)—Scrap corrugated paper cartons are flattened and protection disks and separators stamped from them

Fig. 2—Standardization of arbor holes permits using same wheel on as many as three different machines and still provide grain and bond needed. Original wheel, left, is 42 inches diameter, 3 inches wide; is now used to 36 inches, then recut and used to 30 inches; recut and used to 23 inches; narrowing face at each recut

of tool prints. This file is compiled according to tool description, each section referring to a particular type of tool. Its use eliminates all guesswork in determining the size to which drills, reamers and similar tools are to be reground. Approximately 70,000 tool drawings were reviewed in compiling this information.

All high-speed steels no longer useful in the form of tools are spark-tested for analysis and boxed separately for shipment.

Some 1000 lead hammers for general factory use are made monthly from scrap lead, discarded grinding wheel bushings and old hammers.

Power hacksaw blades are reground and returned to the tool cribs.

When files are worn down, into the reclamation tool crib they go, and in a short while they have completed a visit to a file manufacturer and are back on the job—slightly thinner, perhaps, but none-the-less effective. How many a year . . . Some 16,000!

Plug gages are reground to progressively smaller sizes and put back into service.

Special socket wrenches and tap drivers from assembly lines, when turned in for new equipment, are sent to reclamation where they are inspected for tool failure and possible replacement. Approximately 30 per cent of these tools can be repaired by the manufacturer at 10 per cent of the new tool cost.

Reclamation's study of grinding wheels has led to many new uses for wheels taken off the machine for which they were originally purchased. Standardization of arbor holes permits using the same wheel on as many as three different machines and still provide while still giving the grain size and bond needed on each particular job. See Fig. 2.

The work of recutting is done by outside vendors. Wheels are recut to size, counterbored if necessary, and speed tested. By changing wheel designs, a system of progressing wheels from one machine to another without added alterations has also been made possible. By increasing spindle speeds on a number of stand tool grinders, wheels can now be used down to the blotter.

Special steady rests have been designed to get the maximum out of the stand grinder wheels without loss of wheel efficiency. Worn abrasive disks are trimmed down to the next smaller standard size and put back to work.

Further development in grinding wheel reclamation has been a sectional bond wheel employing one bond and grain size from the outside diameter down to the discarded diameter and another grain size and bond from that diameter to the arbor hole. All that is necessary is to pass the wheel progressively from one machine to another. See Fig. 6.

The standardization of hole sizes for wheels and the setting of correct spindle speeds relative to wheel diameters, of course, are the two essential factors in grinding wheel reclamation.

More than 2000 jigs and fixtures, formerly replaced or scrapped yearly, are now dismantled. Parts having a value that can be reclaimed economically are stored for future use or returned to tool room stores. These items include die sets, standard jig bases, clamps and other component parts.

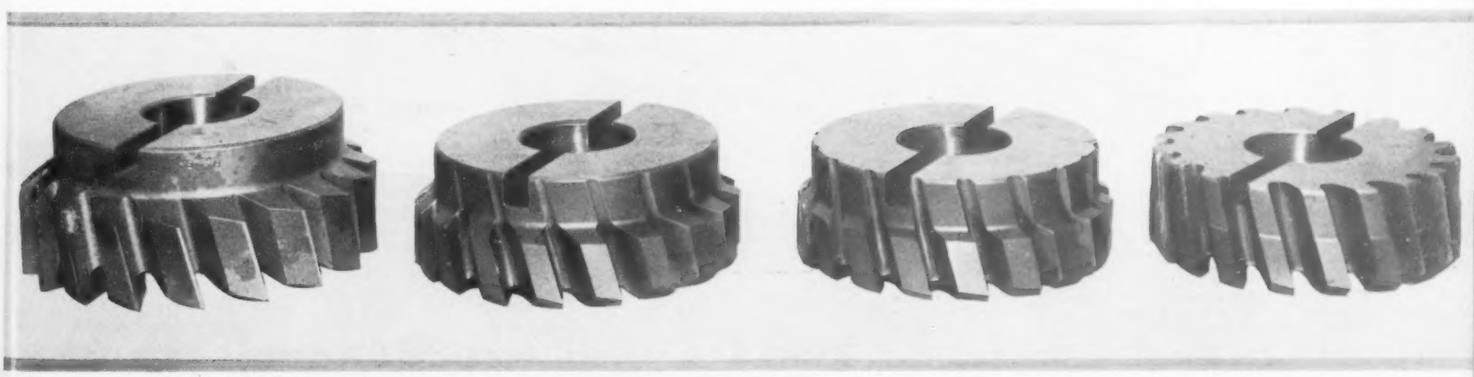
An example of what efficient reclamation means is the case of a special cutter used on the continuous feed drum-type milling machines for milling the roller and shoe surfaces of tractor track links. When new, it is 5½ inches outside diameter and 2¼ inches thick. Originally, including the one recut which was possible, an operator produced 75 to 80 pairs of links per grind, and the life of the tool was good for about 3600 pairs.

Through co-operation by tool design and machine shop supervision, the cutter was redesigned so that three recuts are possible. See Fig. 4. Now the tool is not discarded until it is 4¼ inches outside diameter and 1½ inches thick. An operator can produce 225 to 250 pairs of links per grind, and the life of the new, redesigned tool is good for approximately 18,000 pairs of links.

In another stronghold of reclamation, gray iron borings are pressed into briquettes. See Fig. 7. Borings are dumped into a pit, conveyed overhead into a storage bin, dropped into the hopper of the machine and

Fig. 3. (Right)—Sheared slugs and crop ends are classified and stored; supplied as new material through stock order department

Fig. 4. (Below)—Special cutter 5½ inches outside diameter and 2¼ inches thick is used and recut successfully three times before discarding at 4¼ x 1½ inches



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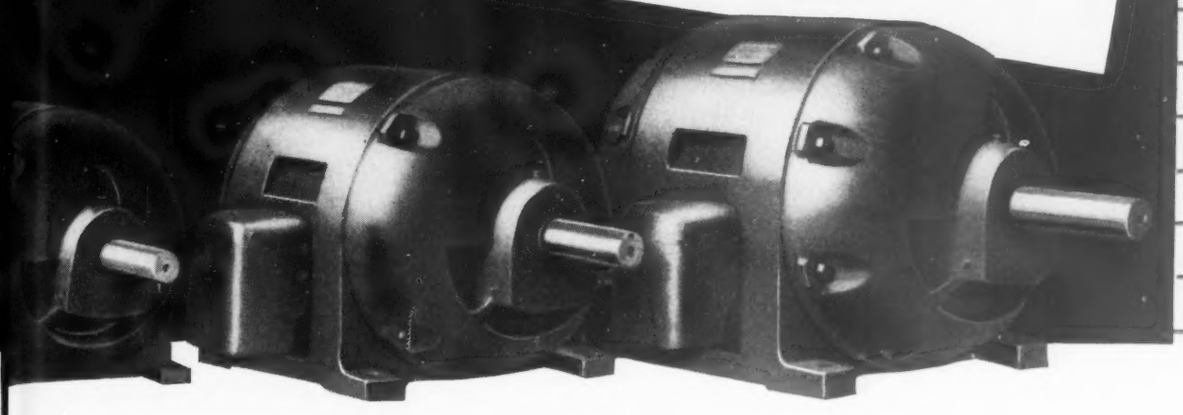

75 hp
60 hp
50 hp
40 hp
30 hp
25 hp
20 hp
15 hp
10 hp
7½ hp
5 hp
3 hp
2 hp
1½ hp
1 hp

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Fig. 5—Thousands of board feet of lumber are reclaimed daily

then metered out for compressing. From this process they are sent to the foundry and charged back into the cupola as iron. Approximately 33 tons of such briquettes are produced daily. Aluminum turnings and borings are accumulated and segregated for conversion into essential parts, thus conserving any alloys contained. This careful reuse of aluminum and other materials is vital.

Few persons will connect big scale wood reclamation with the world's largest makers of track-type tractors, road machinery and diesel engines. But it is a fact that some 30,000 board feet of lumber are reclaimed and cut to size for various requirements each month. Fig. 5 shows portion of wood reclamation. One location manufactures core trays, car stakes and spacers from miscellaneous lumber. Another works with crates and boxes, sending the salvaged wood, cut to size, to the shipping department and knocking down those which may be returned for full credit to the manufacturer.

At one time various commodities were shipped to the plant in large heavy crates which often netted 30 board feet of reclaimable lumber. The management, in conference with the manufacturers, helped design wire-bound crates to register large savings on freight rates. But it was found that savings gained in reduced freight rates did not equal savings formerly effected by salvaging 30 board feet of lumber per crate. Another conference resulted in a crate that could be used several times, being returnable for full credit each time and cutting the freight rate on every trip!

It is easy to see why other departments are eager to work with reclamation with its amazing record for re-furnishing material perfect in all requirements. That's one reason why there are reclamation experts at every location—but these men must be accurate in providing reclaimed material for specified jobs or much of the value of the reclamation department would be lost.

One of the first projects of the full-time reclamation division dealt with corrugated paper. Sturdy paper cartons by the thousands come into the plant. They were once used to feed the incinerator blaze. Now after being flattened, protection disks and separators for packing are stamped from them by machine at the rate of 500,000 a year as shown in Fig. 1. Scrapped advertising literature is separated into sheets and used in the foundry, replacing special paper formerly purchased.

By far the most impressive part of reclamation department is the scrap yard near the foundry—the focal point for an endless stream of scrap promptly examined and segregated. Some 500,000 pounds of metal are sent from the scrap yard to the foundry each week. In dealing with the foundry, the reclamation department functions like an individual company, receiving and filling orders in carload shipments the same as an outside vendor—whether it is a carload of cast iron, compressed bales, heavy melting steel or alloy iron—in the quantity and at the time needed.

In this yard are apprentices taking the 2-year welders' training course. Knowledge of cutting is gained here under actual working conditions. Since all types and sizes of material must be reduced for foundry consumption—from light sheet metal to heavy steel castings and structural shapes—a wider cross section of experience is available here than in any other department. A man's mistakes are seldom of any consequence inasmuch as

(*Please turn to Page* 86)

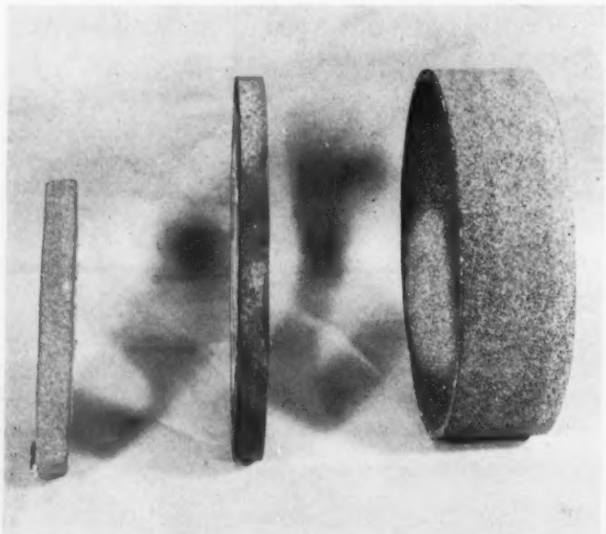
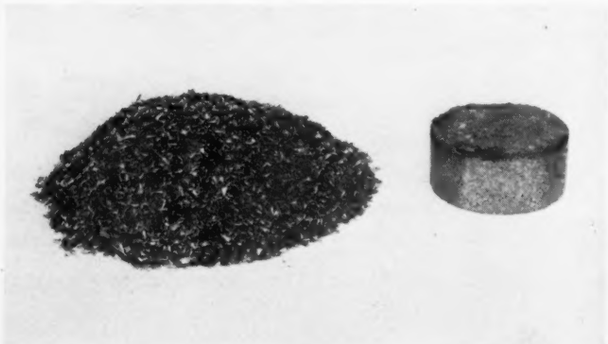
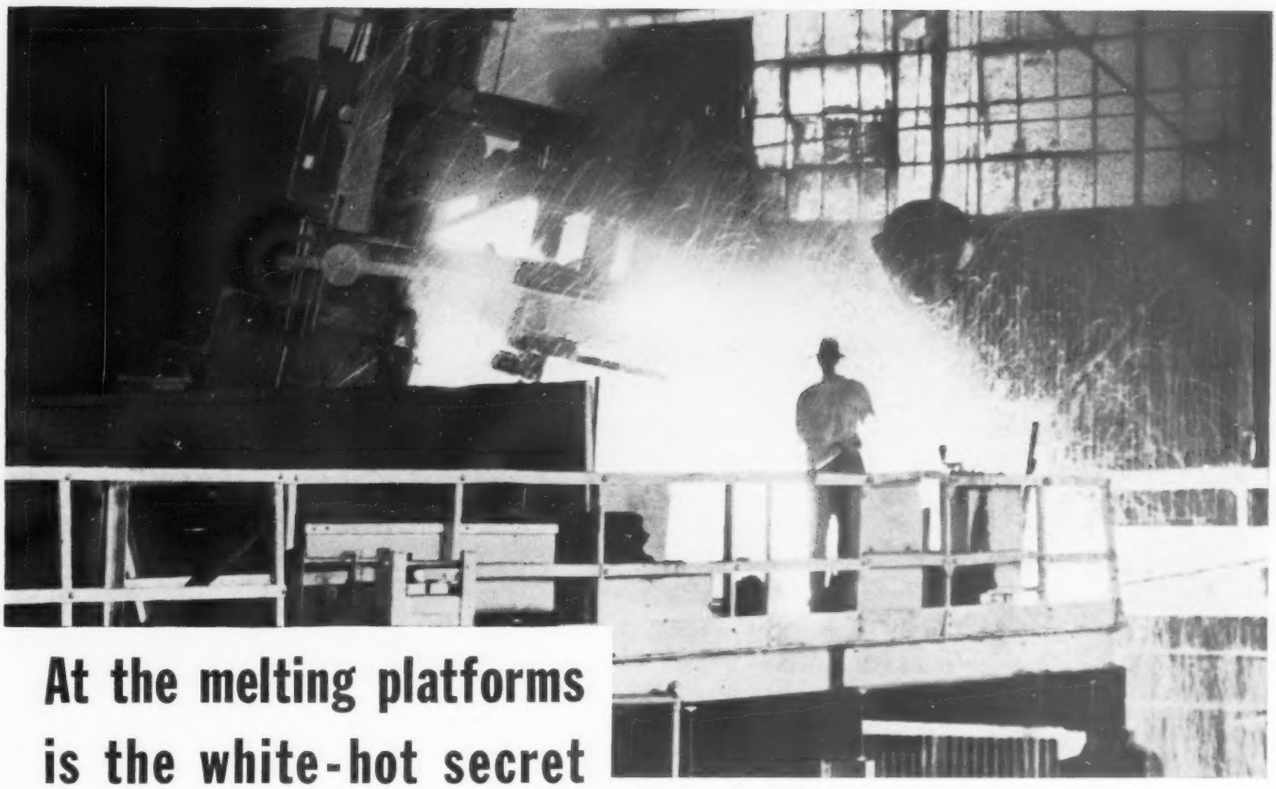


Fig. 6. (Left)—This 12-inch cup wheel contains one size grain and bond in cup portion, another in backing. This permits use of wheel on entirely different application when worn down

Fig. 7. (Below)—About 33 tons of briquettes are produced daily at Caterpillar. Amount of gray iron borings needed for one briquette is shown





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DISSTON TOOL STEELS

Worm REDUCTION DRIVES

For Steel Plant Bridges

By A. E. GIBSON
President
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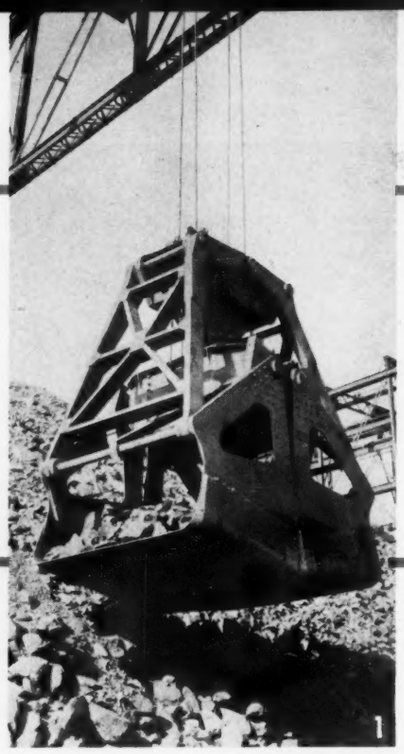


Fig. 1—Williams type, 10-ton low-alloy welded ore bucket which has been in continuous use for over 4 years. It has handled about 7,000,000 tons of ore with three sets of manganese trays and small rope guide rollers at top of bucket as only replacements. Hardened groove, roller bearing sheaves never have been removed

Superior mechanical materials make possible long life and smooth operation of traveling bridges. Abnormal tooth pressures, excessive wear and early parts replacement of worm wheel drives are obviated by accuracy of machining and exactness of tooth contact. Details of design are presented

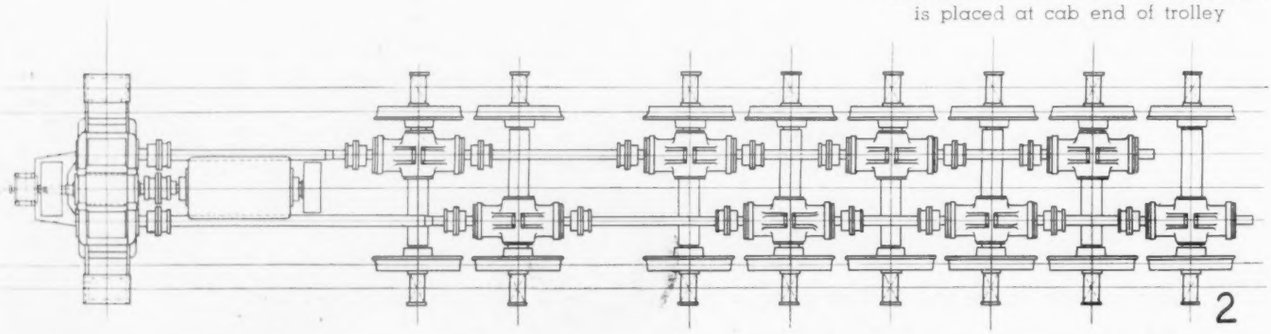
■ DURING the past 10 or 15 years a radical change has taken place in the structural design of material handling bridges due to substituting wide flange beams in place of built-up sections. This has resulted in producing stiffer structures built at lower cost, and having less expense for upkeep. The parts are more accessible for cleaning and painting, and deterioration due to corrosion is greatly reduced. What this will mean in lengthened life of bridges, only the future can tell. As pointed out by Mr. Wolfe in his excellent address before the Iron and Steel Engineers, Cleveland Sept. 23-25, there are many material handling bridges in service which were built more than 30 years ago.

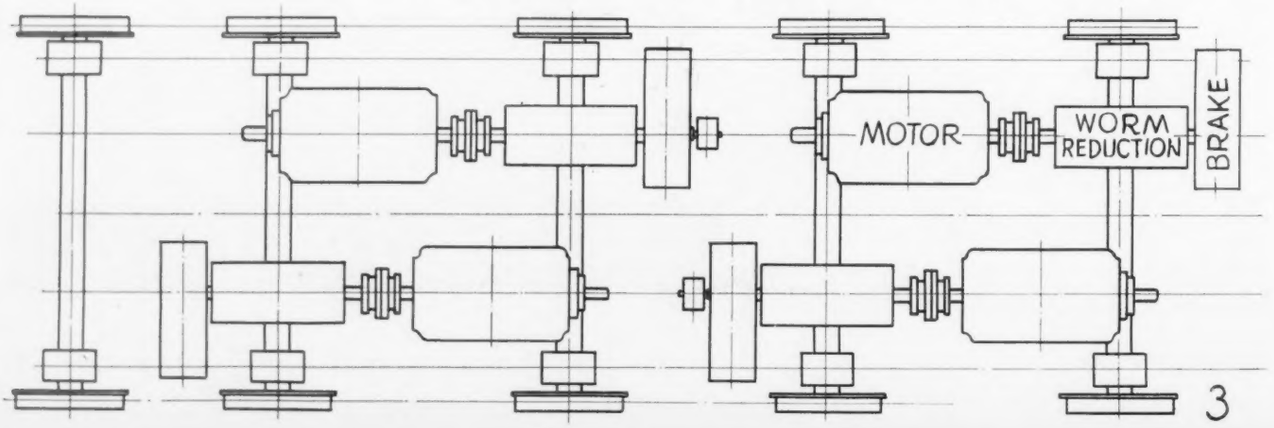
Availability of superior mechanical materials such as alloy steels, antifriction bearings, hardened gears and track wheels, precision hobbed worm wheels, hardened and ground worms, and oil-immersed gearing permits design of bridge mechanical equipment insuring long life and smooth operation. Wear and resultant frequent replacements of mechanical equipment always has been a serious problem to operators. Developments lessening this upkeep cost and loss of operating time are of prime importance to the user.

Development of the SAE steels of high strength and hardenability is

Fig. 2—Arrangement of truck driving axles for 23-ton bridge. Each axle has its own worm reduction. Four sets of driving units are provided, one at each corner of bridge

Fig. 3—Layout of 15-ton ore bridge trolley axle drive. Four of five axles are worm driven; fifth axle is an idler and is placed at cab end of trolley





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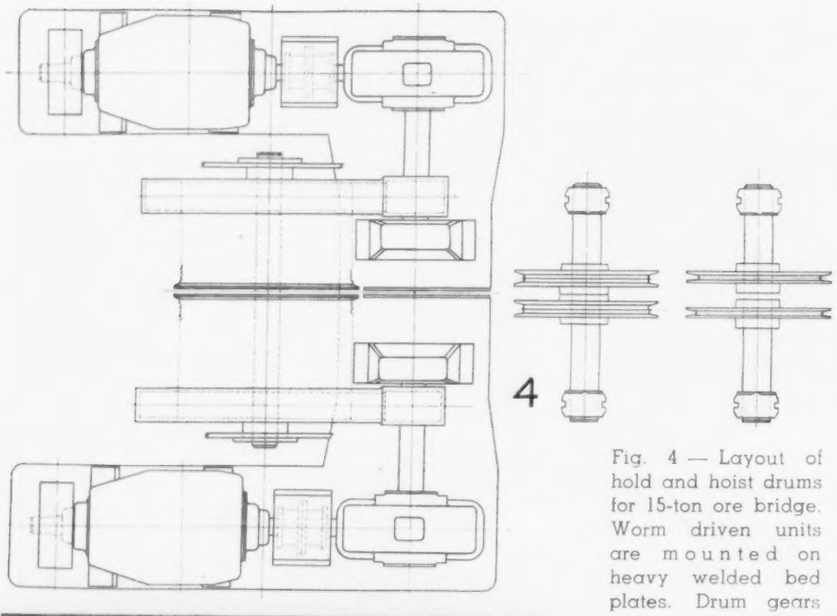


Fig. 4 — Layout of hold and hoist drums for 15-ton ore bridge. Worm driven units are mounted on heavy welded bed plates. Drum gears and pinions have hardened teeth

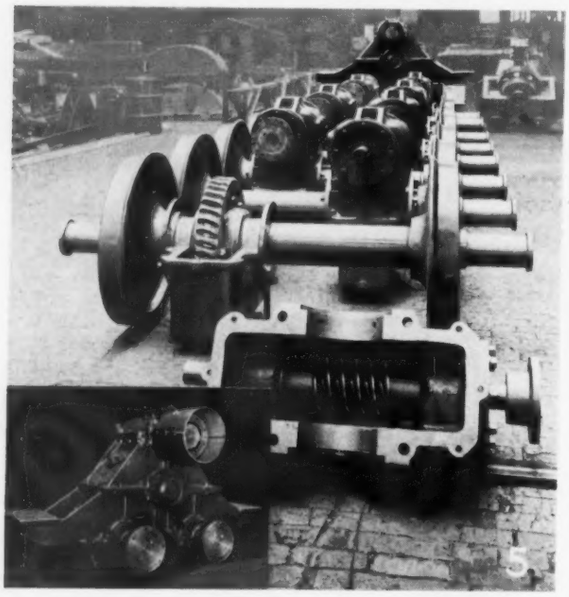


Fig. 5—Set of eight worm axles for 23-ton ore bridge. Duplicate drives support bridge at each corner. Worm units are assembled right and left hand on alternate axles. Two driving shafts coupled to reduction case at far end transmit power to worms. Top half of worm case on front axle is removed to show worm and wheel. (Inset) Welded spur gear reducer with couplings for driving two lines of worm reductions

essential for worm and wheel success. This is true also of shafts, axles, pins and gears which form a part or complement of worm driven units. Steels of the quality of SAE 4620, hardened and ground, are used in such details as drum shafts and sheave pins, thus assuring a life expectancy equal to that of the bridge structure. Particularly over the past 10 to 12 years the steel industry has constantly demanded higher quality in workmanship and materials for equipment subject to hard usage. Factors of safety for calculated sections have increased from the normal 4 or 5 of 20 years ago to as high as 10. Use of low-carbon steel for shafting and pins is prohibited, gear analyses ranging from a minimum of 0.40 per cent carbon to the more complex alloys, and frequently specifications call for gears with hardened teeth.

Long Life Bearings Desired

Antifriction bearings, universal for many years, now have been specified in certain instances to have a life of 30,000 hours (a specification bearing manufacturers are loath to guarantee). The requirement of oil-immersed gearing is general, and flame hardened gear teeth often are designated. In mechanical details we find increasing insistence on welded construction for weight reduction and increased strength. In this connection the use of low-alloy, high-strength steel plays an important role. All of these things are mentioned because in the design of material handling bridges they are essential for capacity, speed, long life and low upkeep cost.

Worm wheel drives are of course not new to industry but in the earlier days of their use, materials available for their construction were far inferior to those of today. The limits of accuracy in today's machining was then unknown, and exactness of tooth contact was given scant attention. This too frequently resulted in abnormal tooth pressures, excessive wear and early replacements of parts.

New designs for worm drives call for the best our metallurgists have developed in materials, the greatest of care in heat treatment, machining and assembly, the use of heavy-duty antifriction bearings, and exactness of assembly which shall elimi-

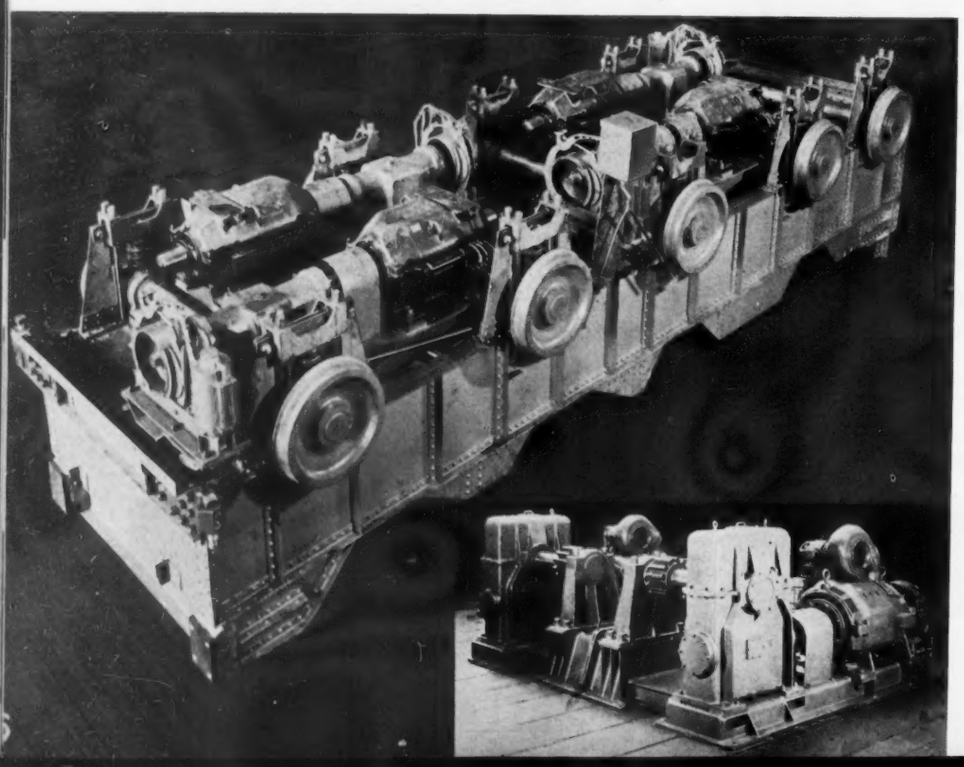


Fig. 6—Shop view of 15-ton ore bridge trolley. Only wheel driving mechanism is mounted on top of trolley. Four of five axles are individually motor and worm gear driven, the fifth axle (over cab) is an idler. Wheel loads and deflection are a minimum. (Inset) Worm driven hoist and hold drums are supported on sub-structure suspended below trolley proper

nate concentrated stresses in any part of the mechanism. Where preloading previous to use is impossible, the wise operator will "nurse" the mechanism, closely watching bearings for heat and teeth for full contact before subjecting it to continuous operation under full load. This is not only true with worm drives but with other types of gearing. There have been many instances where herringbone gears have been ruined under full load in the first few hours run, while slow speed and light loads for a short period of time would have "run-in" the teeth safely.

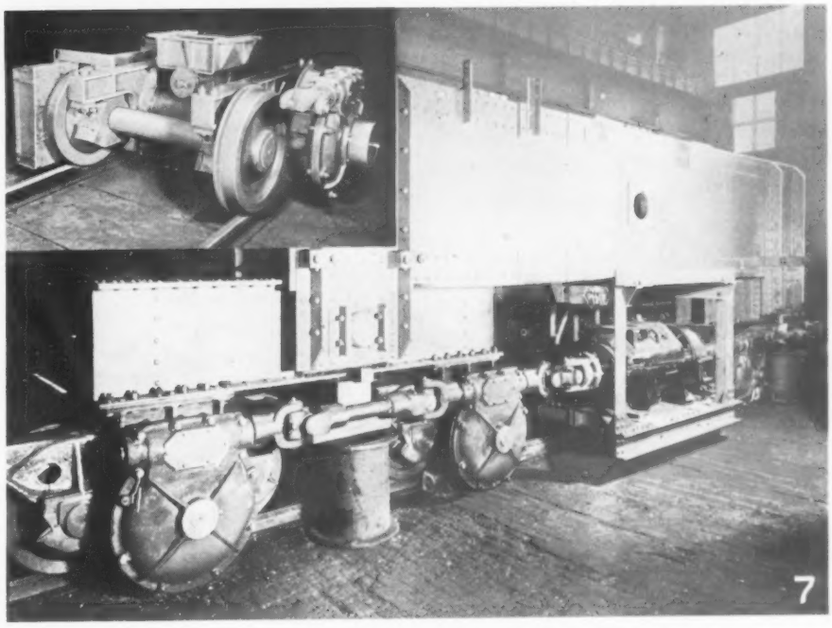
Worm wheel drives on bridges have proven highly satisfactory in the moving mechanism for trucks and equally so in trolley travel drives and drum operation. Perhaps the most outstanding example are two 23-ton capacity ore bridges recently built by the American Bridge Co. in which the Wellman Engineering Co. cooperated by designing and building the mechanical equipment for the bridge travel and trolley operation. This installation consisted of a bridge travel having a total of 64 hardened tread driven wheels, each axle being separately worm driven. Figs. 2 and 5 illustrate one complete driving unit, there being four, one under each corner of the bridge. Each driving unit has a motor and welded gear reduction with two sets of gears having hardened spur teeth, heat treated shafts, and roller bearings. There are two power take-offs flexibly coupled to two shafts each of which drives four worms and through them, their respective axles. The driving wheels are of exact tread diameters, which insures duplicate driving effort on each wheel. The worm wheel cases are designed for heavy-duty, radial-thrust roller bearings for the worms, and bronze bearings for the worm wheels. Alignment of worm and wheel is obtained by the use of split, externally-adjusted steel shims. The worms are of SAE 2320 steel normalized for grain refinement, carburized to 3/16-inch depth, hardened and tempered to 80-90 shore hardness number after which the worm threads and all fits are ground to size.

Chemical specification of the worm wheel rims is as follows:

Element	Per cent
Tin	10.00 to 11.00
Nickel	1.25 to 1.75
Phosphorus	0.025 max.
Lead	0.025 max.
Zinc	Trace
Copper	Remainder

The worm wheel teeth are hobbed carefully to give a true, smooth tooth outline.

Fig. 7 illustrates worm driven trucks of another design. This view, taken in the erecting shop, shows the fully equalized design of the sill and truck details for a 15-ton bridge. The motor, suspended below the main equalizer, drives four trucks through flexible couplings.



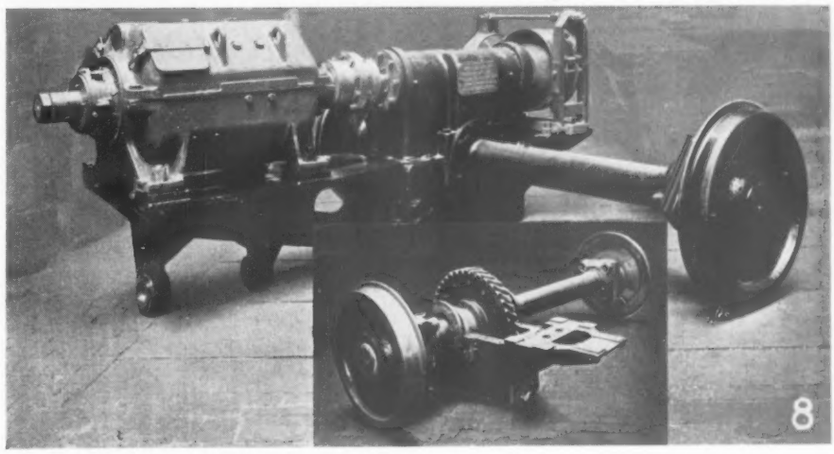


Fig. 7—Worm driven trucks and equalizers for 15-ton ore bridge. Note flexible coupling of worms and motor. Four trucks comprise driving unit for each corner of bridge. (Inset) Worm driven truck for a 7½ ton coal bridge. Truck frames are of welded construction

Fig. 8—One of the trolley axles individually motor driven through worm reduction mounted on axle. Axle bearings are antifriction and wheels hardened. (Inset) Similar assembly with upper half of worm case removed

The inset in Fig. 7 is a worm driven truck for a 7½-ton coal bridge. The truck frames are of welded construction and full equalization is obtained through the center bolster. These trucks also are coupled flexibly in pairs and to the driving motor.

Design of the trolley (see Figs. 3 and 6) is unique in that the trolley structure proper has mounted on it only the wheels, axles, worm reductions and motors. The hoist and hold drum drives are mounted on welded bed plates supported on a structure suspended from the trolley and below this is hung the operator's cab. The inset in Fig. 6 is the hold and hoist drum drives. The 275-horsepower motors are coupled flexibly to sturdy worm reductions which in turn drive the drum pinions. The base plate is of welded construction. The drum pinions are tool steel and the drum gears have flame hardened teeth.

Referring to Fig. 6 it will be seen that there are five axles with ten wheels supporting the trolley, thus holding deflection under load to a minimum. Four of the five axles are individually worm and motor driven, the fifth (over the cab) being an idler. These worm and wheel units are similar in construction to

(*Please turn to Page* 86)

View of entire plant. Tin cans start up the conveyor at right, and drop into tank at left as scrap

RECOVERS BASE METAL

From

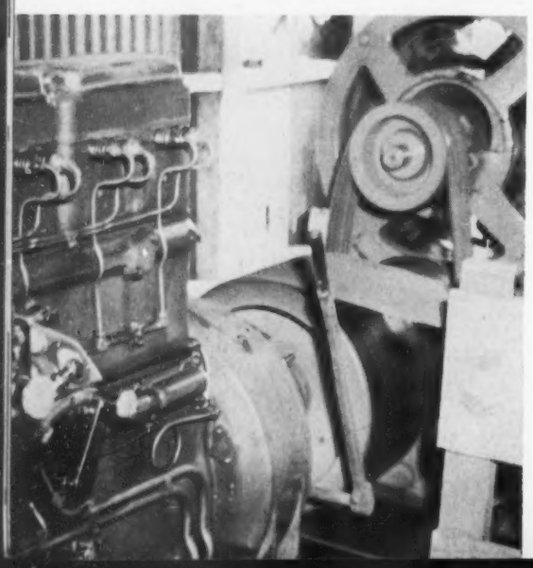
OLD TIN CANS

Western plant de-tins cans, then compresses them in hammer mill, reclaiming around 2½ tons metal every 8 hours. Diesel power is used to operate the mill and generator. About 150 gallons of diesel oil is used per working day, 80 per cent for the burner and 20 per cent for the engine

■ In the southwestern states, particularly Arizona, there is a demand for cheap scrap iron, as many of the copper mines in this area use an iron flotation reagent to remove copper from their oxide ore. Taking advantage of an opportunity to engage in business, H. J. Maffeo and his son set up a small company in Phoenix to provide this material, using as a source for scrap iron old tin cans.

The machinery used in reclaiming the cans is simple and consists in the main of a large burner, metal-cutting hammer mill, and a conveyor system for handling the tin cans.

From an article which appeared in the November, 1941 issue of *Diesel Power*.



Diesel engine which drives generator through V-belts, and hammer through flat belt

Before the installation of the diesel, a 60-horsepower gasoline engine was used to belt drive the hammer mill, and power for the various motors driving the conveyor equipment was taken from a utility line. Use of one diesel to drive the hammer mill and a generator for electric current as well, has resulted in substantial savings. Considering all costs, operating, investment, insurance, etc., the saving is one-third the cost of operating the gasoline engine plus the $50 to $65 per month previously spent for utility electricity. In addition, production has been doubled.

Tin cans, gathered by the company and purchased from other collectors, are dumped in the plant's yard near a conveyor belt. Two to four men fork the cans on a belt. This conveyor belt is about 30 feet long and travels to about 20 feet above ground to empty the cans into a large rotating burner. Oil ignited under forced draft in the burner maintains a temperature of about 900 degrees Fahr. This detins the cans and burns up any trash or paper which might be on or in them. The burner is constructed with a screen false bottom, thus allowing the burned-out material, dust solder and tin to drop to the ground into wheelbarrows by way of a chute. Some tin is reclaimed from this waste but it is only considered a by-product of the primary operation.

The heat-cleaned cans from the burner drop into a chute 25 feet long which takes them to the hammer mill. The mill is manganese lined and made of cast steel, and requires about 50 horsepower to operate. A 3-horsepower suction fan set in the chute removes any remaining dust and dirt.

The conveyor lifts the material into a 3 x 10-foot rotating screen which allows all material 2 inches and less in size to drop directly into a 30-ton storage bin on which the screen is installed. If necessary, the scrap can be further transferred from this bin to an adjacent one holding 150 tons.

The quantity of oversize material from the rotating screen is small and what there is of it drops into a small tub. The tub is filled only about once a day. An entry in the chute feeding the hammer mill permits the oversize to be dumped back into the hammer mill to be reworked. The outfit produces about 2 tons of finished material per day, which is its rated capacity. However, as much as 2½ tons has been produced in 8 hours.

The diesel has a 4⅞-inch bore by 6-inch stroke and develops 85 horsepower at 1200 revolutions per minute. The hookup of the engine and driven members is unusual and most practical.

Both engine and generator are mounted on the same I-beams, which, in turn, are supported on concrete blocks. The shaft from the engine power takeoff is 24 inches long. It mounts a 12 x 18-inch diameter flat pulley, then extends through an outboard bearing and mounts a second pulley on the

other side of the bearing. The first pulley drives the hammer mill, and the second pulley drives the generator through V-belts. The generator is a Westinghouse 25-kilovolt-ampere, 250-volt, 3-phase, 60-cycle machine turning at 1800 revolutions per minute. The exciter is belt driven from an extension of the generator rotorshaft.

Fuel oil is stored in a 5500-gallon fuel tank located about 100 feet from the engine. This tank supplies both the diesel and the burner. The line to the engine is underground and as the tank is elevated, a gravity feed is provided. An accurate check on the fuel consumption of the diesel has never been made as the fuel oil for both the engine and the oil burner comes from a common tank. However, about 150 gallons of diesel fuel oil are used per working day, the burner taking approximately 120 gallons and the engine the remaining 30.

The power room is underneath the plant, almost completely exposed to the hard iron dust which permeates the grounds. Consequently, the engine has been equipped with an oil filter and dual air cleaners fitted with special bottles, to cope with the extremely dusty conditions prevailing.

Gives Trends of U. S. Tin Consumption

■ Various tin consumption trends in the United States in the present emergency are touched upon in the current issue of "Tin and Its Uses", quarterly review of the Tin Research Institute now available free of charge from Battelle Memorial Institute, Columbus, O.

The publication discusses relative merits of tin and suggested alternatives, concluding that major changes in the use of tin would involve substantial expenditures on research and new equipment. According to the publication, American stocks and deliveries of tin are favorable at present, and if the analogy of British experience is followed, war production will still further stimulate, rather than diminish, tin consumption.

The issue reviews the institute's program of industrial research and includes articles discussing alternatives for palm oil and tallow in the hot-tinning process; an Australian test of the institute's process for protecting tinplate against sulphur-staining by foodstuffs; further improvements in tinfoil and a pictorial record of special uses of canned foods in war-time England.

Technical Progress

(Concluded from Page 62)

mium steel plate produced with edges of an austenitic chromium-nickel steel that contains columbium or titanium. The clad edges can then be joined by welding the austenitic steel in the usual way without affecting the straight-chromium steel plate to any harmful extent.

Another important development is the production of calcium metal used by the ferrous industries in highly alloyed steels as a deoxidizer and scavenger. In the nonferrous field it is similarly used and also employed as an alloying agent and for a host of special applications. Calcium metal, formerly obtainable only from Germany and France, is now being produced and made available by sources within the United States.

Issues Supplements For A.S.T.M. Standards

■ *A.S.T.M. Standards,* 1941 *Supplements;* published by American Society for Testing Materials, Philadelphia; to nonmembers, any one part $3, two parts $5, all three parts $7; members, for extra copies, $2, $3.50 and $5.

These supplements bring up to date the 1939 triennial publication of standards by the society. Part I, metals, contains 125 standards, 619 pages; Part II, nonmetallic materials, constructional, 126 standards, 449 pages; Part III, nonmetallic materials, general, 119 standards, 663 pages.

The supplements contain new and revised standards, tentative standards and proposed revisions. They bring information up to date on all the society's work.

A new publication will be issued in 1942, in three volumes, incorporating all standards and revisions, completely re-edited. The society also has issued an index to its standards, as of December, 1941, containing 196 pages, which is furnished without charge on written requests.

New Alloy Bonds Without Use of Flux

■ A new metal alloy, Galvalloy, recently introduced by Metalloy Co., Box 3093, Terminal annex, Los Angeles, is reported to obtain a perfect soldering bond with aluminum or aluminum alloys without use of flux of any sort. It also is said to bond practically all types of metals allowing the bonding of aluminum or aluminum alloys to these metals.

In using the material, the surface to be coated or soldered is heated with a welding torch to about 600 degrees Fahr., then a stick of the alloy is applied directly to the heated surface. Next a stiff wire brush is used briskly in all directions until a bright finish is secured. If a heavy deposit is desired, after the initial bond, more material is applied and agitated with a paddle or wire brush until the required thickness is obtained.

The alloy can be used for many purposes, it is claimed. It can be used in foundries where aluminum castings are made for filling blow holes or defects. It also can be used as a protective coating on welded seams or other areas where a non-corrosive coating is needed.

Canadian War Workers' "Taxi"

■ **This all-steel Lindsay Structure trailer, several hundred of which have been ordered by the Canadian government, is capable of transporting 100 men to their respective posts in shell loading plants. The trailer is 31½ feet long, 94 inches wide and 102 inches high. Folding seats enable its use in other capacities while not being used for passenger service. Lindsay Structure is the product of Dry Zero Corp., Chicago**

SHELL BODIES

. . . are heat treated uniformly in new rolling radiant-tube furnace

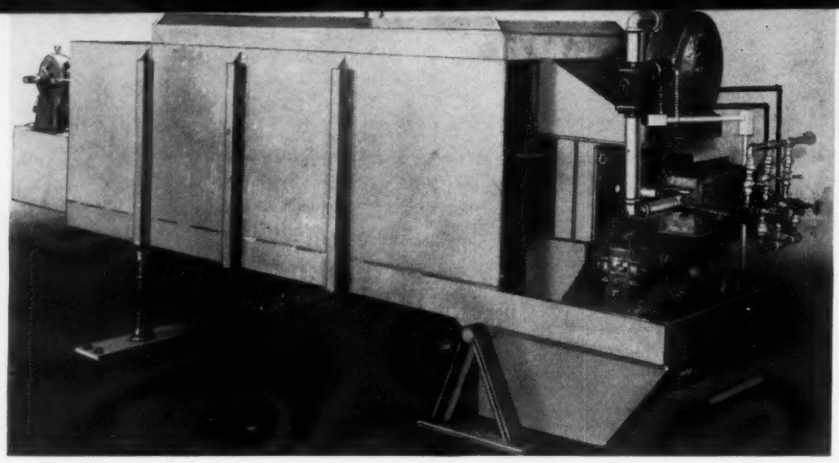


Fig. 1—New furnace is supported on pivots so adjustment of the jackscrews changes tilt of furnace and tubes to feed work through furnace at speed desired by operator

■ ONE of the most important functions of industrial furnaces is to heat uniformly. Especially is this true of furnaces used to heat treat shell bodies.

Too often the record of a single thermocouple some place in the heating chamber is looked upon as representative of the temperature of the material. This is not necessarily so. In fact, it is the exception rather than the rule. In compact cross sections there will usually be variation top and bottom, end to end, or side to side, and of course this can only be shown up by exploring thermocouples attached to the material itself.

Temperature variation in the heat treatment is probably the most common cause of rejections due to lack of uniform hardness in the finished product. Therefore of particular interest is a new type of furnace that affords uniform heating of rollable objects. It was developed by Lee Wilson Sales Corp. of Cleveland.

The heating elements and conveyor in this furnace are one and the same. They consist of alloy heat resisting tubes rotated close together on a slight incline that is adjustable. Gas is fired into these tubes at one end, the same as any conventional radiant tube. Burners of unit in Fig. 1 are shown at right of illustration. Motor, gear reducer and chain drives to rotate tubes are also at this end. Jacks and hinge support allow slope of tubes and furnace to be adjusted to get desired rate of feed through furnace.

The material to be heated such as projectiles, stud bolts, piston pins, brass extrusion slugs or any other rollable objects are delivered by magazine pusher feed into the grooves between the heater-conveyor rolls. The work is rotated quite rapidly as it progresses slowly through the heating chamber, the rate of travel depending on the angle of inclination of the furnace toward the discharge end. See plan and side view diagrams, Fig. 2.

In the unit shown, three rolls carry two lines of shell bodies or similar items through the furnace. Note rolls are driven through a common chain drive, all three rolls revolving in the same direction. This action causes the work to revolve in the opposite direction.

At the discharge end, the rolls taper to allow sufficient space between them for the material to drop through sealed chutes to the quench tank.

This novel method of heating has a number of advantages. The furnace chamber is small in cross section and sealed off from the products of combustion and the outside air so that "protective" atmospheres can be admitted and surround the material as it travels through the furnace.

Too, the material being heated is rotated rapidly as it travels slowly endwise and is in direct contact with the radiant heating and conveyor tubes so that it heats rapidly and uniformly.

Also, the capacity of the furnace is in proportion to the number of roller tubes side by side, these being of standardized diameter and length and easily added by units in the original design.

Proof of uniform heating is established convincingly by chart records of extremely sensitive radiation pyrometers sighting through the roof directly onto the material as it moves through the furnace. Because it rotates rapidly and moves forward slowly, the sighting point traces a closely wound, spring-like spiral path around the material and so explores it effectively for temperature variation.

The record of this exploration on the pyrometer chart shows up as a straight line with negligible deviations, proving conclusively that all parts of the work are at exactly equal temperature.

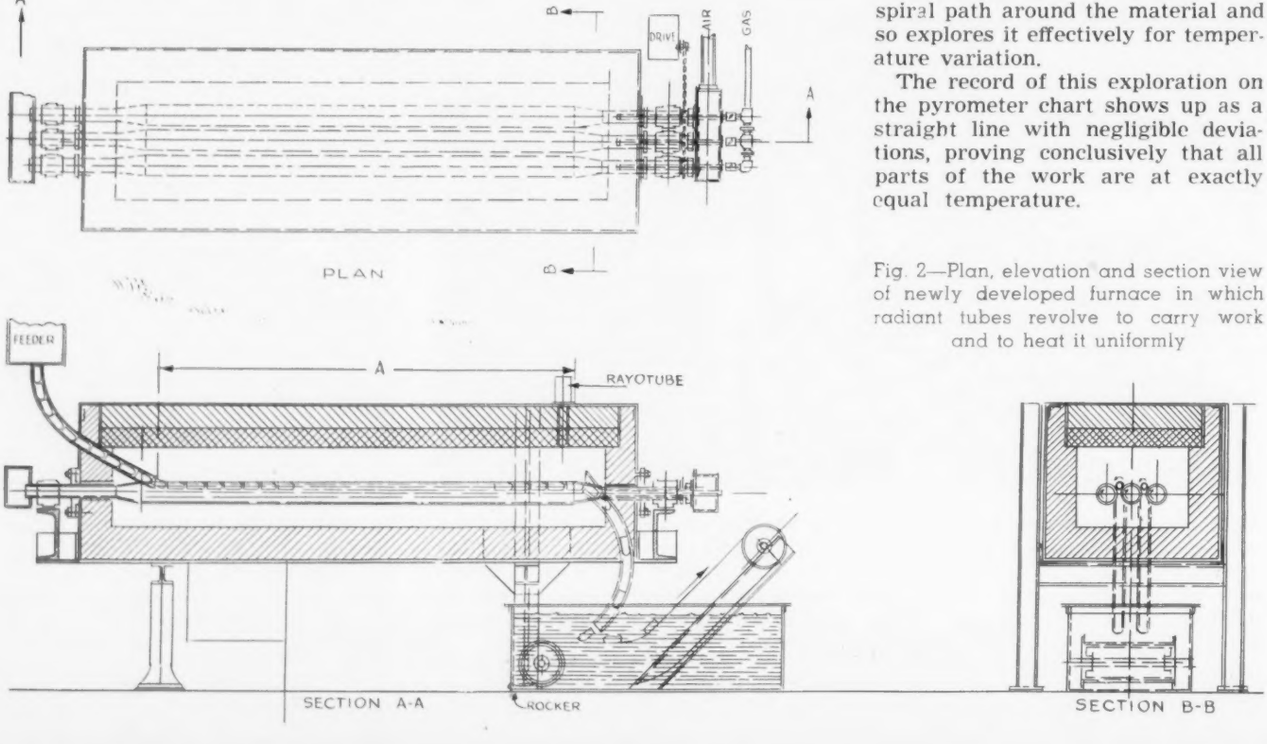
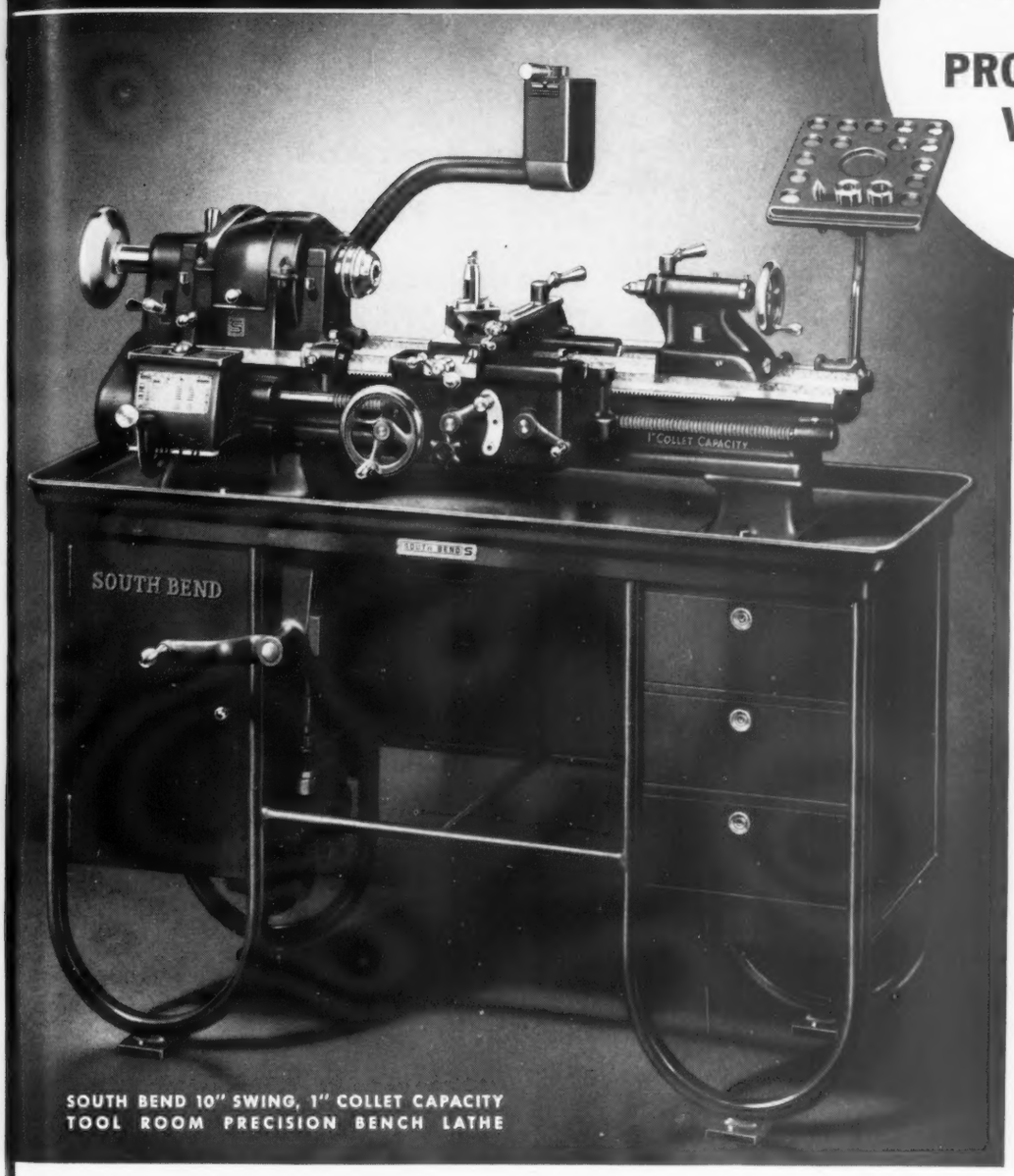


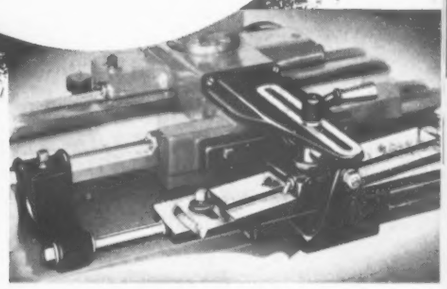
Fig. 2—Plan, elevation and section view of newly developed furnace in which radiant tubes revolve to carry work and to heat it uniformly

SOUTH BEND LATHES

REDUCE COSTS
•
INCREASE ACCURACY
•
PROVIDE GREATER VERSATILITY
•

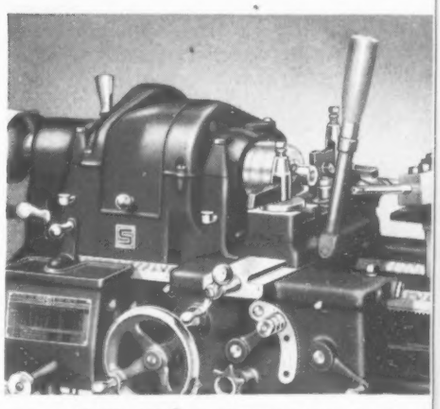


SOUTH BEND 10" SWING, 1" COLLET CAPACITY
TOOL ROOM PRECISION BENCH LATHE



TELESCOPIC TAPER ATTACHMENT
Turns and bores tapers up to 3½ inches per foot smoothly, easily, accurately. Telescopic feature eliminates disconnecting cross feed screw when taper attachment is in use.

HAND LEVER DRAW-IN COLLET CHUCK
For rapid production of small parts from bar stock or tubing. Stock is released and fed through collet without stopping spindle.



HAND LEVER DOUBLE TOOL REST
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MODERN in design, built with extreme precision, South Bend Lathes are fast—accurate—versatile. They have high spindle speeds and rigidity essential for efficient machining with carbide or diamond tipped tools. They are capable of finish turning or boring with such precision that subsequent grinding, honing or lapping operations are often eliminated. And they have plenty of power for roughing cuts.

Features responsible for the excellent performance of South Bend Lathes include an alloy steel spindle with hardened and superfinished bearing surfaces, one piece double wall apron with steel gears running in oil, a powerful worm drive and multiple disc friction clutch operating carriage feeds, and a direct belt drive to spindle.

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LET'S GO! U.S.A. KEEP 'EM FLYING!

View taken at the approximate center of the main bay looking toward the steel foundry. The main gangway and car track are just beyond the molding sand heaps

HANDLING MATERIALS

In Iron and Steel Foundry

Adequate planning facilitates production yet requires only small amount of handling equipment

By FRANCIS A. WESTBROOK

■ MECHANICAL handling of materials has been worked out ingeniously and with efficient economy in the gray iron and steel foundry of the Sullivan Machinery Co., Claremont, N. H., manufacturers of a wide line of air compressors and pneumatically operated devices.

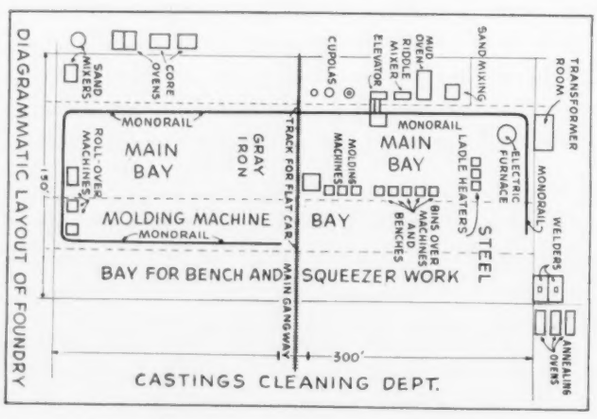
The foundry building approximately 150 x 300 feet is divided by columns into four longitudinal bays and these in turn are divided transversely at the center by a wide gangway and narrow gage industrial railroad as shown in the accompanying diagram. Gray iron castings are made on one side of the main gangway and steel castings are made on the other side. All lifting and handling of sand, flasks, metal and castings is done by overhead electric traveling cranes, a long monorail and stationary hoists serving the larger molding machines.

Under the conditions existing in this plant it has been possible to arrange the sand hoppers in such a manner that they can be filled from containers suspended from the traveling cranes. The hoppers and other production stations are supplied with sand by the night crane made by the Harnischfeger Corp., Milwaukee. The crane moves sand and castings in the gray iron section of the bay and keeps the hoppers supplied with sand in the steel molding section. This bay also is equipped with seven ladles suspended from single steel members supported on the same tracks as those used by the traveling crane. These give complete coverage even where a large number of molds are on the floor. The ladles easily are filled from the monorail extending from the furnaces and around the outside of the main bay and the molding machine bay. The ladles also may be filled from a ladle suspended from the traveling crane in the molding machine bay if that is desirable for any reason or when the amount of metal to be distributed is in comparatively small volume.

The molding machine bay is spanned by two 5-ton Harnischfeger cranes which handle all the materials including the castings, flasks made by the Sterling Wheelbarrow Co., Milwaukee. The operator on one crane has the responsibility of keeping the sand hoppers filled over the molding machines in this bay made by Johnson & Jennings Co., Cleveland, and by the Herman Pneumatic Machine Co., Pittsburgh. The sand hoppers are directly underneath the crane cab so that the operator at all times can note the amount of sand.

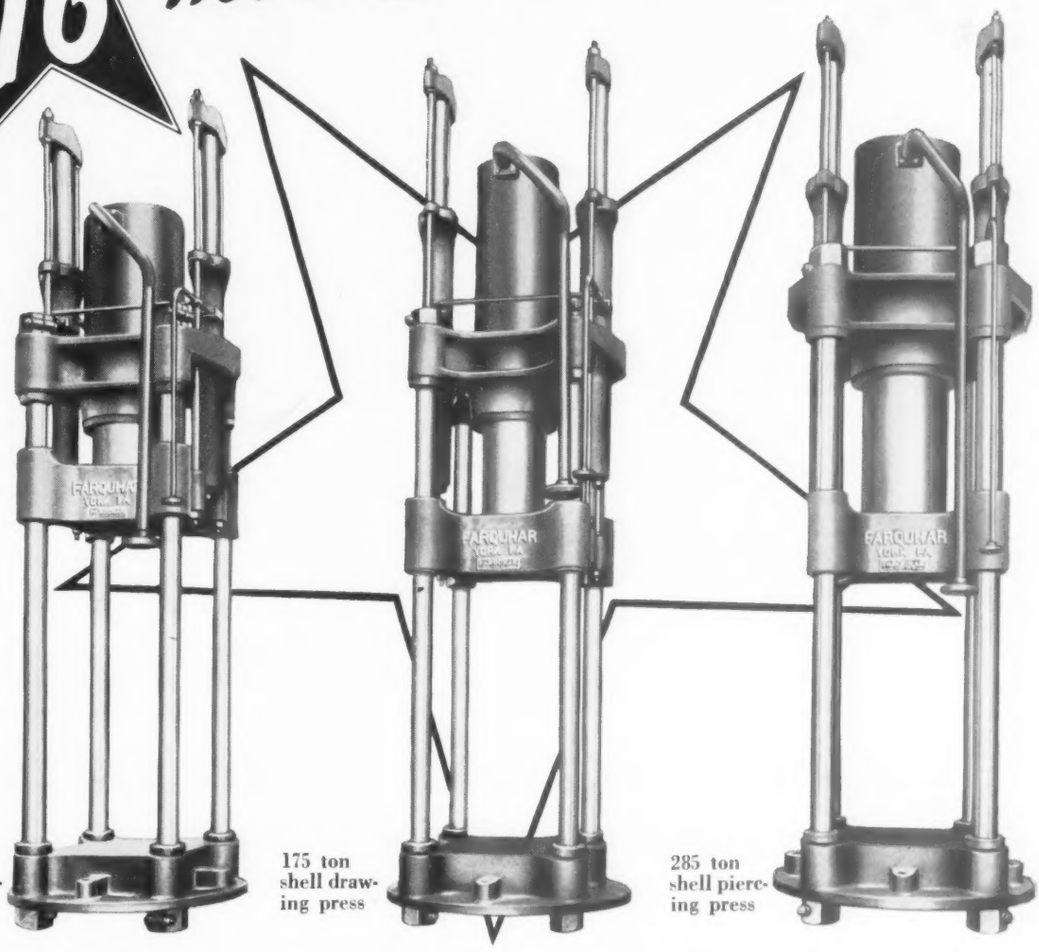
The main bay where the heavier castings are made is spanned by three traveling cranes, one of 10 tons and the other two of 15 tons lifting capacity. Molds in the steel section are made on a battery of three rollover jolt machines, two with a lifting capacity of 1000 pounds each and the third with a lifting capacity of 3000 pounds made by the Herman Pneumatic Machine Co. Flasks and molds on the largest machine are handled by one of the Sullivan Machinery Co. pneumatic hoists on a jib crane. A small electric hoist on another jib crane performs similar duty on two 1000-pounds units.

Backing and facing sand mixing equipment is located near the upper end of the first bay as shown in the illustration. Where the castings are shaken out the sand falls through a grating in the floor onto a short belt which discharges into the boot of a bucket elevator. The sand passes over a magnetic pulley and through a revolving riddle into a hopper. Measured amounts are mixed and discharged from the mixer into steel buckets which are loaded on flat cars and moved on the narrow gage railroad to the main gangway where the crane picks them up and discharges the sand at any desired point. The facing sand mixer is operated practically in the same manner. The hopper is filled by the crane. A smaller hopper equipped with a screen below the main hopper measures the amount and removes fines and dust. The measured amount flows by gravity into a smaller hopper. A small air hoist tilts one end so that the contents flow into the mixer. The sand is drawn off in buckets and delivered by crane



Rough sketch showing general location of various departments and materials handling facilities

16 more Star Performers



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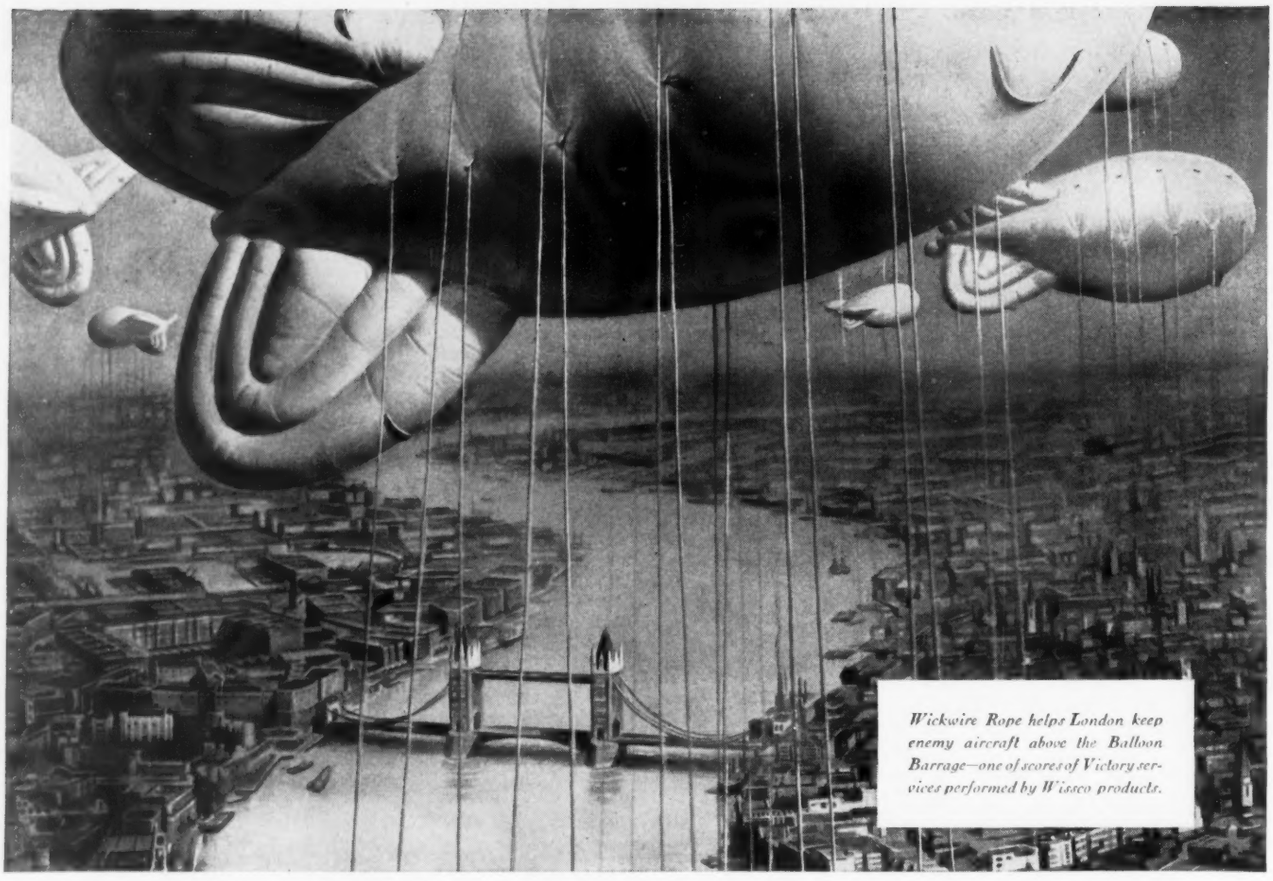

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WISSCO PRODUCTS

to the various molding machine hoppers.

Large molds for iron or steel castings are made on a 10-ton Herman Pneumatic machine located in the main bay near the central gangway. A battery of three somewhat smaller machines are located at the lower end of the main bay. Flat cars loaded with cores, flasks or castings on the central track are pulled by one of the cranes or by an air hoist mounted horizontally. Loaded cars leaving the cleaning room are pushed by one of the electric trucks. The cleaning room is serviced by two 10-ton cranes The core room in a half bay adjacent to the main bay also is served by two 5-ton traveling cranes.

The author expresses his thanks to James Prendergast, foundry superintendent, Sullivan Machinery Co., Claremont, N. H., for data supplied in the preparation of this article.

Revised Practice on Roofing Ternes Approved

■ Revision of the recommendation on roofing ternes recently approved by the industry will be effective as of Jan. 1, 1942, according to the division of simplified practice, National Bureau of Standards, Washington.

In the current revision, identified as R30-42, four weights of coating are eliminated—15, 25, 30 and 32 pounds per double base box. This leaves the 8, 20 and 40-pound coatings as the simplified list. The standard coating weights are to be embossed on each 14 x 20-inch and 20 x 28-inch sheet.

Until printed copies are available, free mimeographed copies of this recommendation may be obtained from the division of simplified practice, National Bureau of Standards.

Increases Production Of Tin-Saving Metal

■ Increased production of a metal that will effect a substantial saving in the use of tin is reported by Phelps Dodge Copper Products Corp., 40 Wall street, New York. Manufactured exclusively by the corporation, the product, P-M-G Hardener, can be used in place of tin in production of bronze castings, and is said to produce a good casting at no greater cost.

The product already is being used by the Navy and by private shipbuilders in very large tonnages according to the report. It is said to be exceptionally valuable in the manufacture of valves, pump bodies, impellers, flanges, valve trims and other type castings including projectile hoists and gun mounts.

Brazilian Steel Plant

(*Concluded from Page* 57)

finally suspended its work in 1897 and the assets existing at the time went to the Bank of Overseas of Rio de Janeiro, which held it under mortgage until 1921 when the property was acquired by the Companhia Siderurgica Belgo-Mineira. This concern already had the intention of erecting a metallurgical plant on this favorable location where ore, fuel and hydraulic power were concentrated in an area of but a few miles. However, this project, which represented the third trial to found a metallurgical industry on the estate of Monlevade, could not be carried out immediately due to the lack of rail transportation.

Finally in 1934 through the initiative of the company and the farsightedness of President Getulio Vargas, the railroad, linking Bello Horizonte, capital of the State of Minas Geraes with the port of Victoria, capital of the State of Espirito Santo, was completed, thus providing the necessary transportation facilities for the execution of the project.

The Companhia Siderurgica Belgo-Mineira in addition to the new plant at Monlevade also owns a plant at Sabara, which is about, an hour and a half out of Belo Horizonte and four and a half hours out of Belo Horizonte and four hours by automobile from Monlevade. The Sabara plant is now operating with the equipment shown in the accompanying table.

This future output of 190,000 tons represents about 50 per cent of the present steel-consuming power of Brazil but with the great progress and rapid strides that Brazil is making these days in its industrial growth consumption will probably be around 600,000 or 700,000 tons of steel before the end of 1943.

"Rule" for Measuring Vibrations

■ **Mechanical vibrations in this 25-kilowatt motor-generator set are measured quickly and accurately with the reed-type Westinghouse Vibrometer shown above. No larger than a slide rule, it will indicate separately all primary frequencies and harmonics within a frequency range of from 500 to 20,000 cycles per minute**

How Presidents Have Quelled Civil Disorder

■ *The Presidents and Civil Disorder*, by Bennett Milton Rich; cloth; 235 pages, 6 x 9 inches, published by the Brookings Institution, Washington, for $2.

Recent labor disturbances culminating in action placing industrial plants under military control makes this volume interesting reading. In the past, federal troops have been used to quell civil disorder arising from unpopular laws, political struggles, racial conflicts and labor disputes. Use of troops has been resorted to by many presidents, including Washington, Jackson, Cleveland and the Roosevelts.

This study, which is well documented, shows how the presidents have handled the major instances of domestic disorder, from the Whisky Rebellion and the Dorr Rebellion, down to the strike at North American Aviation plants in California.

Emphasis is placed on the method used by the presidents and how the armed forces have terminated the disturbances.

VACUUM Aids Formation of Powder Metallurgical Compacts

By CHARLES HARDY
President
Hardy Metallurgical Co.
New York

■ ONE OF the principal difficulties in powder metallurgy comes from the fact that metal powders do not flow readily. This restricts the variety of shapes that can be made successfully by powder metallurgy and also, on occasion, requires complicated mold design to make compacts of uniform density. A second problem in powder metallurgy resides in the fact that a relatively high compression ratio must be employed in order to obtain compacts having a density equivalent to that of forged and cast material. Thus, some metal powders in the unconsolidated condition occupy three or four times as much space as they do after compression. This makes for long plunger strokes in the dies and sometimes requires larger apparatus than would otherwise be necessary.

Evacuation of the die, and also of the powders prior to introduction in the die is of aid in overcoming the foregoing difficulties. Moreover, evacuation of metal powders during or prior to compression is an aid in avoiding the formation of laminations or planes of weakness in a compact.

A considerable amount of experimental work upon the evacuation of metal powders prior to or during compression has been done in the United States and also in Europe. However, only one concern has adopted the practice commercially in the United States in contrast with several who employ the method in Europe. It is believed that a wider adoption of the practice, at least in certain instances, might well bring about improved powder metallurgical products as well as savings in cost of operation.

Generally speaking, the finer the metal powder, the greater are the difficulties in getting it to flow under ordinary atmospheric conditions, and the greater is the increase in flow rate of the metal powder and of the compactness which the powder will attain when evacuated. The increase in flow rate is illustrated by the following tests:

Dry copper powders were placed in a hopper having a valued orifice about ⅛-inch in diameter in the bottom opening into a reservoir below the hopper. Both reservoir and hopper were provided with vacuum connections so that they could be evacuated. In the first instance, the flow rate of each type of powder through the orifice was measured with atmospheric pressure (760 millimeters of mercury) in both hopper and reservoir. This was compared with the flow rate of the same powder in vacuo, i.e., with both hopper and reservoir exhausted to an absolute pressure of 4 millimeters of mercury, as indicated by a manometer reading of 756 millimeters of mercury. The results obtained are shown in Table 1.

As the results show, a remarkable increase in the flow rate of coarse metal powder (Type B) through a small orifice is obtained in vacuo, but the increase in flow rate over that obtained under atmospheric conditions is greater with a finer powder (Type R), while very fine powder (Type C) which will not flow at all through an ⅛-inch orifice under atmospheric conditions, flows rapidly through the same orifice in vacuo.

Metal powders, especially when dry, can be compacted to a greater extent in vacuum when at least a portion of the gas which they entrain under atmospheric conditions has been removed, even though no great compressing force is applied. Moreover, vibration of the powders in vacuo aids considerably in increasing the flow rate of the powder and also the degree of compactness obtainable.

Generally speaking, the finer the powder, the more compact it becomes when entrapped gases have been removed, even partially. With fine metal powders (say, Type C) the volume occupied by the powder mass decreases and the apparent density of the powder mass increases by at least 20 per cent in a vacuum equivalent to an absolute pressure of 3 millimeters of mercury. However, a greater decrease in the volume occupied by a mass of even coarser powders (say Type B) can be obtained if the powder is shaken or vibrated in an evacuated space. The increase in compactness of the powder, thus obtained before compression by a piston in a mold, is of assistance in making accurately formed objects. Moreover, it permits more metal powder to be placed in a space prior to compression, and thus permits larger articles to be manufactured in a given press. It is also an important factor in obtaining increased density with the application of a minimum of compressive force.

However, the greatest saving in compressive force is due to the elimination of the cushioning effect of the gas in the mold in which com-

Schematic sketch of an apparatus adapted to put the metal powder under a vacuum both before mold filling and during compression

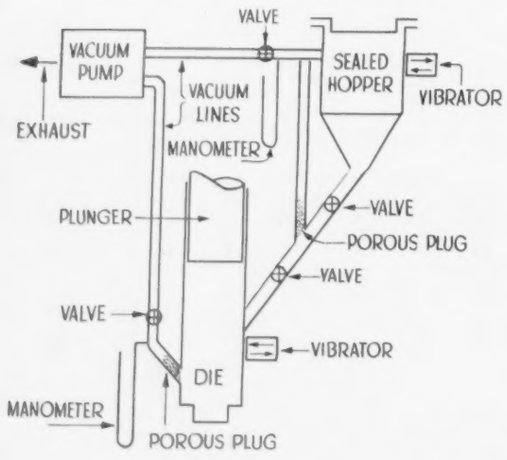
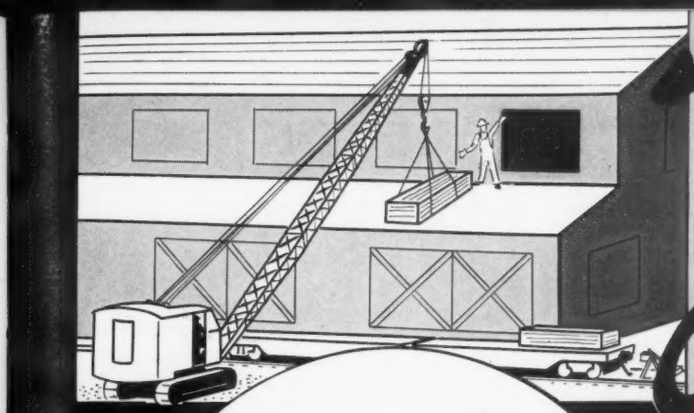


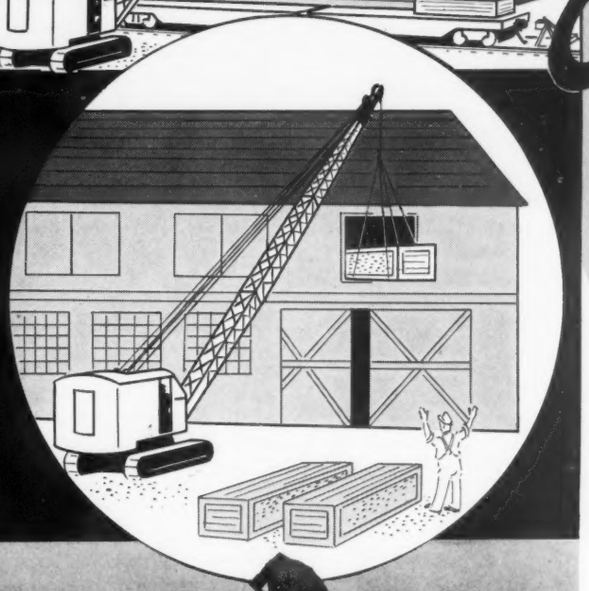
TABLE 1—Flow Data

Type of powder	B	C	R
*Screen analyses of powder			
Per cent plus 100 mesh	0.3	0.03	Trace
Per cent minus 100 mesh, plus 150 mesh	14.0	0.07	2.0
Per cent minus 150 mesh, plus 200 mesh	20.0	0.33	10.5
Per cent minus 200 mesh, plus 250 mesh	7.0	0.23	†21.5
Per cent minus 250 mesh, plus 325 mesh	23.0	4.83	
Per cent minus 325 mesh	35.7	94.50	65.0
Grams powder flowing through ⅛" diameter orifice per minute			
I—With gas pressure corresponding to 760 mm. Hg on both sides of orifice	382	None	110
II—With gas pressure corresponding to 4 mm. Hg on both sides of orifice	600	410	535

*Tyler scale.
†Minus 200, plus 325 mesh.



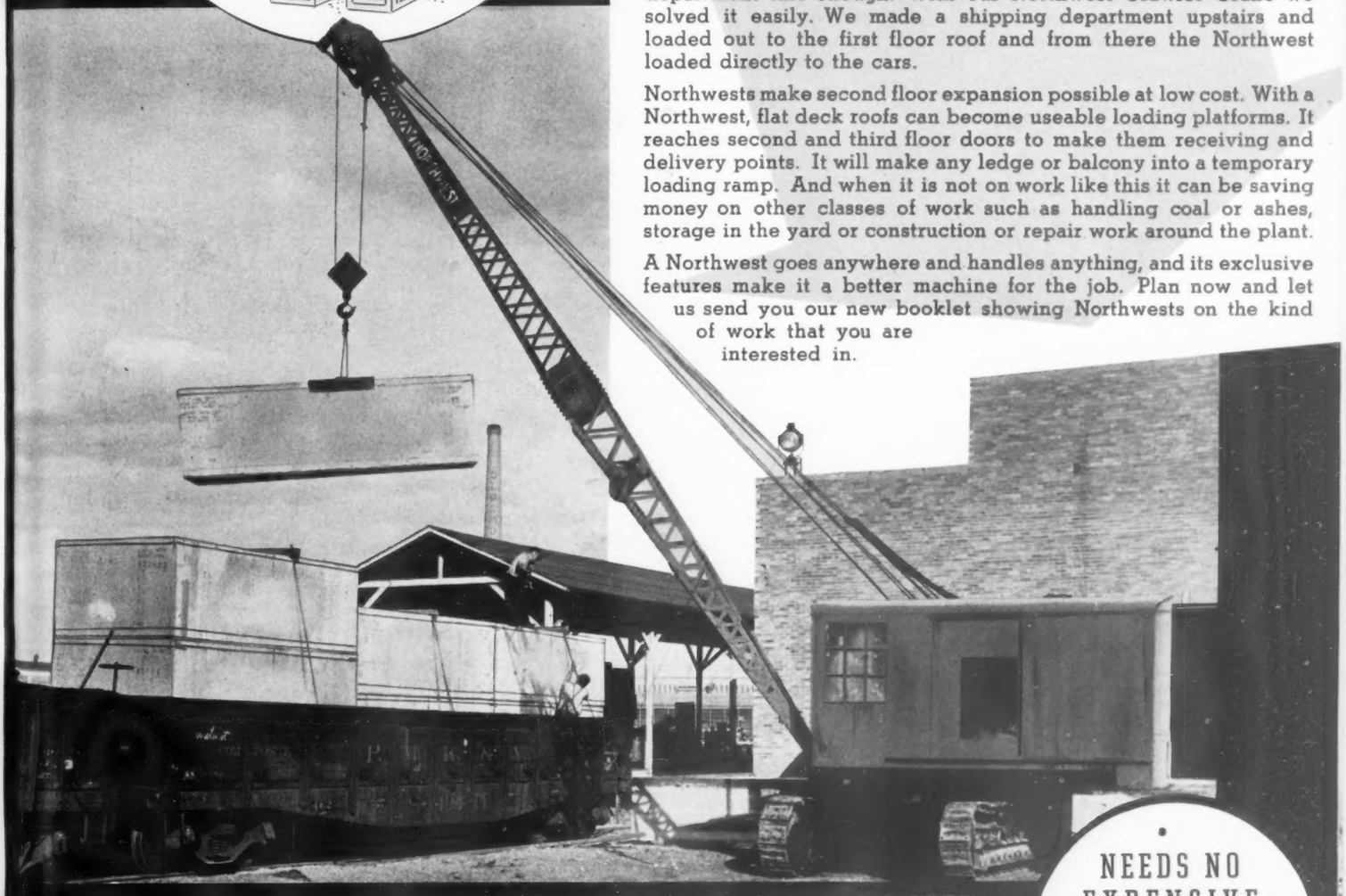
Makes OVERHEAD LOADING POINTS useable



WE had a problem. Our second floor expansion was such that we couldn't get the stuff downstairs and into the shipping department fast enough. With our Northwest Crawler Crane we solved it easily. We made a shipping department upstairs and loaded out to the first floor roof and from there the Northwest loaded directly to the cars.

Northwests make second floor expansion possible at low cost. With a Northwest, flat deck roofs can become useable loading platforms. It reaches second and third floor doors to make them receiving and delivery points. It will make any ledge or balcony into a temporary loading ramp. And when it is not on work like this it can be saving money on other classes of work such as handling coal or ashes, storage in the yard or construction or repair work around the plant.

A Northwest goes anywhere and handles anything, and its exclusive features make it a better machine for the job. Plan now and let us send you our new booklet showing Northwests on the kind of work that you are interested in.



NEEDS NO EXPENSIVE TRACKS OR OVERHEAD EQUIPMENT

NORTHWEST ENGINEERING COMPANY

1805 Steger Building · 28 East Jackson Boulevard · Chicago, Illinois

NORTHWEST

pression takes place. It might be thought that the only saving in compressive force obtainable by removing entrapped gas from the powders subjected to compression, would be at best about 15 pounds per square inch, since this is the maximum force exerted by the gas under atmospheric conditions. However, a much greater saving in compressive force results.

For example, the density obtainable by compressing, under a force of 25 tons per square inch, metal powders (Type C) containing the air which these powders entrap under normal atmospheric conditions, is also obtainable with a force of only 5 tons per square inch in an environment having an absolute pressure of 3 millimeters of mercury. This represents a saving of approximately 80 per cent in compressive force, and power.

If desired, the degree of vacuum obtained in the mold prior to compression of the powders can be controlled to regulate the density and degree of porosity of the compressed object, the compressive forces applied by the piston being held substantially constant.

Powder Should Be Dry

Thus a press can be set to apply a maximum force of say 10 tons per square inch, and a dense body of small but controlled porosity obtained by exhausting the gas from the powders with a high degree of vacuum. Or a more porous body can be obtained, through the application of the same compressive force but with a lesser degree of vacuum and consequent increase in the amount of gas entrained in the powders subjected to compression.

The powders should be relatively dry in order to obtain maximum flow rate and compactness in the mold prior to compression. However, binders such as powdered metallic soaps, may be employed because these materials do not interfere markedly with the flow rates of powders in which they are included.

The advantages of evacuation in powder metallurgical compression may be recapitulated as follows:

Increased speed of mold filling and consequent acceleration of operations and increased production for a press.

Increased accuracy of configuration in the pressed article, especially when the mold is of complicated shape.

Elimination of planes of weakness and elimination of lack of homogeneity in structure and density of the finished article.

Greater compactness of powders prior to compression, leading to the production of longer objects in a given press.

Reduction of oxidation of the metal powders prior to and during treatment, with consequent improved welding together of the particles.

Lower compressive force to obtain a product of given density, thereby increasing the size of objects obtainable in a given press and decreasing power consumption.

Worm Reduction Drives

(Concluded from Page 75)

the bridge travel worm cases. Fig. 8 shows one of the assembled trolley axles. The inset is a similar assembly in which the upper half of the worm case has been removed to show the worm wheel. Adjustment for worm and wheel tooth alignment is obtained by externally applied shims the same as with the bridge wheel drives.

Hoist and hold units are motor driven through worm gearing and are shown in Fig. 4 (also in the inset in Fig. 6) with the sheave arrangement for leading the ropes from the drums to the bucket. The drum and sheave shafts are of SAE 4620 steel normalized, carburized and hardened to 80 shore hardness and ground. Both the drum and sheave shafts are stationary and the drums and sheaves are bushed. Automatic pressure lubrication is used for bearings throughout.

No bridge is better than the bucket it operates.

Industry finally has come to realize this fact and today demands the best obtainable in bucket design. The Wellman company has pioneered in the development of welded low-alloy, heat-treated buckets. The resulting designs employ box section heat treated, low-alloy weldments of light weight and high strength so that many annoying delays have been avoided. Fig. 1 illustrates a bucket of 10-ton capacity, which has been in continuous operation for over four years without even having any sheaves (which are flame hardened in the groove) removed for replacement of the roller bearings.

Panning "Pay Dirt"

(Concluded from Page 70)

he is producing scrap. The reclamation division as a whole, in fact, offers an ideal training course for apprentices due to its broad scope of activities, which encounter every phase of manufacture.

All material 12-gage and lighter with no potential use except scrap is compressed into bales for foundry use along with skeleton stock, wire, nails, slugs, stringers, rusty barrel hoops and other items known to industry as "hair". To a company that manufactures its own parts, as is done here, the scrap yard has a particular significance for it returns to the foundry scrap steel and iron of known analysis. Much scrap is re-used as new. The yard expert knows materials and sizes used in the machine shop and supervises assortment of the waste accordingly.

Heavy channel, structural shapes, rails, pipe, etc., are fed to the powerful alligator shear and cut to foundry charging dimensions as heavy melting scrap. Usable crop ends are trimmed to standard widths and sizes on the squaring shear.

This material is then stored in racks according to size and specification and identified in accordance with standard practices.

Keeps Record of Reclaimed Stock

The reclamation expert in charge notifies the machine shop as to what he has on hand, and the machine shop draws on reclamation stock accordingly through the stock order department. Portion of reclaimed stock is shown in Fig. 3. Records are kept on all reclaimed material and rigid inspections made. Samples of all parts practical to make from scrap are kept available for quick reference, if reference is necessary. Last year 1167 different kinds of parts totaling 1,432,828 pieces were made from scrap, crop ends and slugs.

Even empty five-gallon paint buckets have their place in the general pattern. They not only replace galvanized pails, ordinarily purchased, but make excellent and safe kerosene containers when provided with the proper type of cover, also made from scrap material.

Hand pads aren't overlooked, either. If worn and soiled, they are sent to reclamation. When a sufficient supply is collected, the pads are cleaned and renewed for redistribution.

When one becomes "reclamation minded", it is often amazing how much material can be prepared for profitable re-use in one form or another as the above examples will indicate.

Issues Booklet on Tin Coating of Tinplate

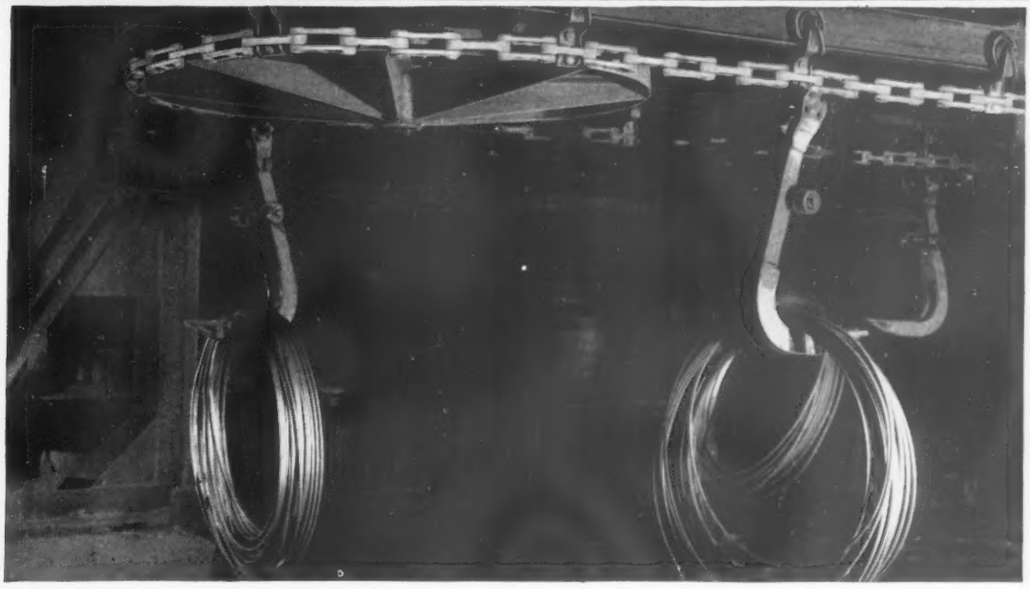
■ Publication No. 106, a 7-page booklet dealing with the longitudinal ridged structure in the tin coating of tinplate, and issued by the Tin Research Institute is now available from Battelle Memorial Institute 505 King avenue, Columbus, O. It describes characteristics of the longitudinal structure and advances a physical explanation of the mechanism involved in its formation. The publication also contains drawings and other engineering data.

OVERHEAD CONVEYING

turns obsolete plant layouts into straightline methods

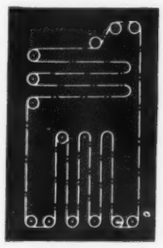
Saves Floor Space—
Avoids Congestion

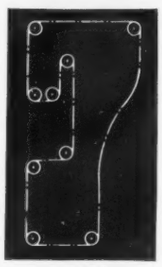
Saves Power—
Reduces Maintenance

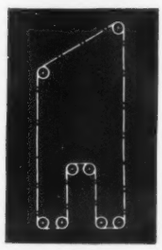


Coils of rods are cooled, banded, and inspected as they are handled on this Link-Belt Overhead Trolley Conveyor from reels to storage building.

The path of travel may be Long—Short—Straight—Irregular.







• The Link-Belt overhead trolley conveyor has almost unlimited possibilities in flexibility, capacity and length. It is a readily adaptable, simple, inexpensive method of conveying—easily installed around existing equipment, readily altered and requires little power to operate and practically no maintenance.

Suspended from overhead, it saves floor space, makes ceilings or roof trusses pay dividends, and travels irregular paths, as conditions demand —turns obsolete plant layouts into straightline methods without costly rebuilding. Profit by Link-Belt's knowledge and experience in solving material handling problems. Send for Book No. 1630.

LINK-BELT COMPANY

Engineers and Manufacturers of Specialized Machinery for the Iron and Steel Industry

Chicago, Indianapolis, Philadelphia, Atlanta, Dallas, Pittsburgh, Cleveland, Detroit, San Francisco, Toronto
Offices, warehouses and distributors in principal cities. 8669A

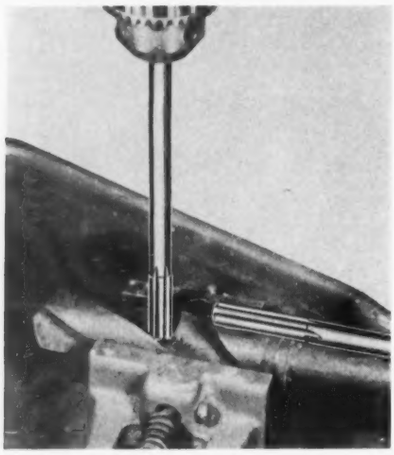
LINK-BELT CONVEYORS

LINK-BELT **EQUIPMENT INCLUDES:** Elevators and Conveyors of all types . . . Coal and Ashes Handling Equipment . . . Automatic Coal Stokers . . . Vibrating Screens . . . Roto-Louvre Heat Dryers and Coolers . . . Skip Hoists . . . Car Spotters and Haulage Systems . . . Portable Conveyors and Bucket Loaders . . . Silent and Roller Chain Drives . . . Speed Reducers . . . Variable Speed Transmissions . . . Chains and attachments of all types (malleable Iron, Promal and Steel) . . . Sprockets . . . Gears . . . Clutches . . . Couplings . . . Friction Fighter Self-aligning Ball and Roller Bearings . . . Babbitted Bearing Units . . . Base Plates . . . Take-Ups, Shafting, etc.

Industrial Equipment

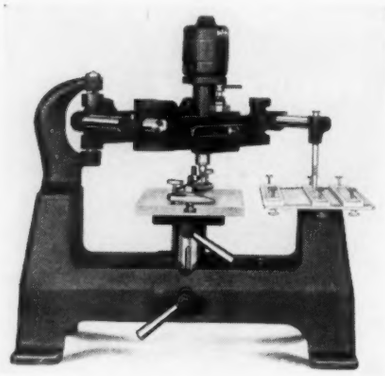
Hard Steel Reamer

■ Black Drill Co., 5005 Euclid avenue, Cleveland, announces a new type Hardsteel reamer capable of reaming hardened steel of any degree of hardness without annealing. It is designed to operate in the same manner as a drill and will ream metal of any hardness up to and including nitrided surfaces. It is said to have been used successfully on carburized, oil hardened, water hardened, cyanided and nitrided pieces of high carbon, high chromium and high-speed steel.



Pantographic Machine

■ H. P. Preis Engraving Machine Co., 157 Summit street, Newark, N. J., has introduced an improved machine of pantographic operation for rotary engraving, electrical marking, and acid etching. Using separate heads for the three classes of work, it provides reductions from 1.8:1 down to 5:1. With the engraving head, the depth of cut is controlled, independent of the depth of the master characters, by a micrometer adjustment mechanism. Movement of the cutter is controlled by a cam-action drop lever, independent of the vertical position of the tracing stylus. The cutter spindle is driven by a ball-bearing motor. All metals, from mild steel to soft alloys, can be engraved with this setup. The electrical marking head is served by a transformer with a 10-stage voltage-control switch for selecting any desired degree of marking, from very light to very heavy. Contact of the marking point with the work is controlled by sensitive spring pressure. The acid etching head is used for cutting through an acid-resisting coating on metal or glass, in preparation for the application of the acid etching fluid. Designed for bench mounting, the basic machine measures 21 inches long, 14 inches wide and 15 inches high.



Portable Demagnetizer

■ Ideal Commutator Dresser Co., 5076 Park avenue, Sycamore, Ill., announces a new portable demagnetizer for demagnetizing tools, drills, punches, dies and work held in magnetic chucks. It removes abrasive particles that cannot be wiped off clean with a rag after a single pass across the magnetic poles. Large parts may be demagnetized in a similar manner, except that the demagnetizer is moved over the heavy, bulky work. The unit is equipped with an indicating light which shows when current is on. It is enclosed in a metal case and measures 5¼ x 10½ x 4½ inches.

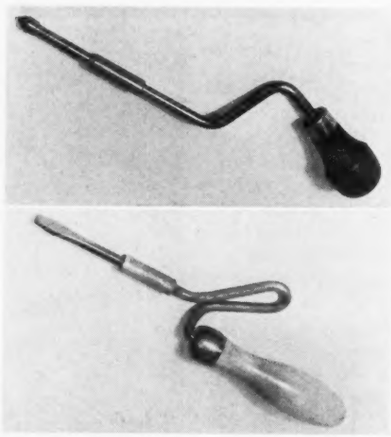
Milling Machine

■ Bremacc Corp., 9114 East Forest avenue, Detroit, has introduced a new down-cut milling machine for down cutting work and for conventional milling. It is said to produce an exceptionally smooth, dull surface without the least sign of chatter marking. Spiral fluted cylindrical cutters, face and side cutters, grooving and profile cutters, all can be used with equal facility on the down cut principle.

In addition, precision boring of all kinds on production work as well as precision tool building can be accomplished on the machine, due largely to the sensitive screw feed attachment built into the spindle housing. Vertical cross and longitudinal hand and power feeds together with rapid traverse also are included.

Rivet Sets

■ Products Engineering Co., 700 East Florence avenue, Los Angeles, announces new type Peco rivet sets designed particularly for aircraft riveting. Available in two types, for flush riveting or for standard Brazier and round head riveting, the new rivet sets are said to be ground to rigid specifications of shanks and faces and are claimed to be almost foolproof even when used by amateurs.



The flush sets have a face design that eliminates dishing and marring of skins and surfaces, while the standard rivet sets are designed to avoid ringing and marking when tipped to angles up to 7 degrees.

Tube Checker

■ Weltronic Corp., 3080 East Outer drive, Detroit, has placed on the market a universal self-contained tube checker for industrial electronic tubes. Provided with seven sockets, it may be used to check virtually every well-known make and type (except ignitrons). Special tubes are checked through use of socket adaptors. The checker provides, through a 1-inch cathode ray tube, a visual analysis of plate current, while high vacuum tubes also can be checked with the milliammeter provided. The instrument, which is housed in black crackle-finish box with sloping con-

EC&M RIBBED CASE MAGNET

Ribbed
✓ FOR STRENGTH
✓ FOR COOL OPERATION

THIS *ALL-PURPOSE* LIFTING MAGNET (TYPE SA)

SAVES *Time, Money, Space*

This magnet handles scrap quickly and easily. And when used for unloading, it sweeps the car bottoms clean.

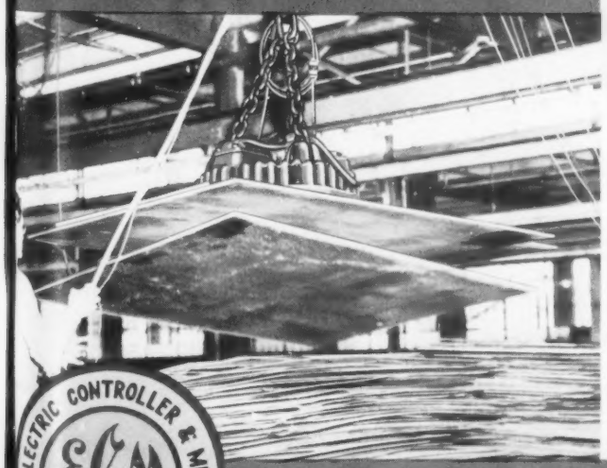
★ Here's a "universal" magnet that you can use on almost any kind of magnetic materials handling job. It is strongly built (ribbed) to stand the hard jolts a magnet is bound to get. The ribs mean large radiation surface thereby maintaining high lifting capacity.

It saves money because of its high lifting capacity (1) per pound of weight, (2) per ampere of current and (3) per dollar invested.

A strong magnet for general use—one that handles material quickly and easily—and brings excellent returns on the investment. You should have all the facts about it. Ask for Bulletin 900 describing this universal Type SA and special types as well.

THE ELECTRIC CONTROLLER & MFG. CO., Cleveland, Ohio

No. 3½ Type SA Lifting Magnet conveying buggies of wood from ground level to cupola charging floor level. Also used to handle pig iron and castings at this foundry.



Handling both incoming and outgoing shipments of steel plates by an EC&M Type SA Lifting Magnet speeds up operations with safety. There is no lost time in prying apart plates to affix chains—no danger of crowbar or chain slippage. The skilled operator can lift a single plate or drop off a single plate as needed.

From stock pile to freight car—any magnetic material—any size—EC&M Type SA Lifting Magnet makes light work of it as shown in this job.

THE ELECTRIC CONTROLLER & MFG. CO. EC&M CLEVELAND, OHIO

IMPROVED MAGNET OPERATION

WITH EC&M *Automatic-Discharge* CONTROLLER

FOR ALL SIZES AND TYPES OF MAGNETS

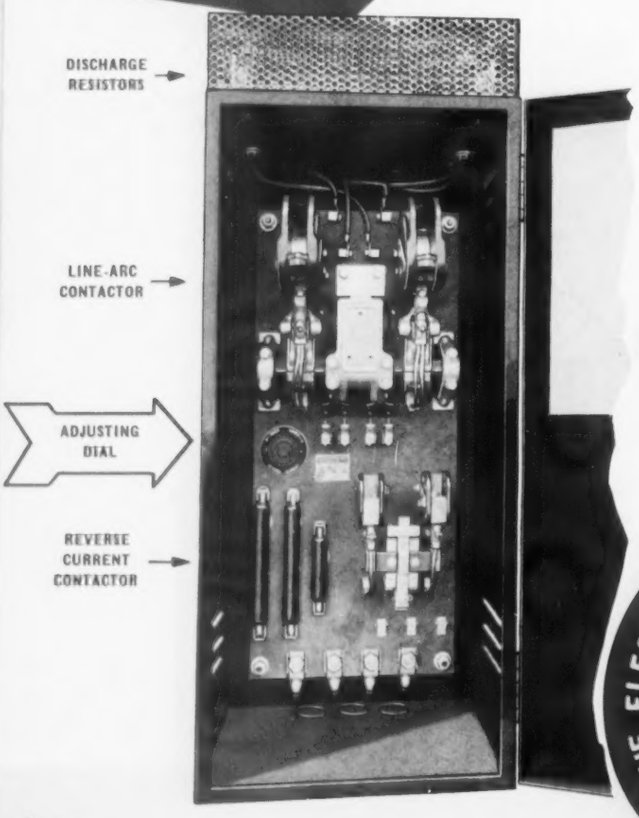
★ This *adjustable* magnet controller offers the feature of *automatic discharge* which guarantees a fast release of any load. It is *adjustable* to voltage, size of magnet or type of load. This is *exclusive* with the EC&M Magnet Controller.

Another valuable feature is its ability to keep *lifting capacity* at a high value all day long. Since reverse-current is turned off automatically, cooler magnet operation follows, thereby maintaining this higher lifting capacity.

And *contacts last many times longer*—for the *LINE-ARC* principle controls the arc scientifically—at instant of opening, arc is transferred from contacts to arcing-plate and blow-out guard, assuring *cool contacts, longer life, lower upkeep.*

Ask for Bulletin AD giving complete data.

THE ELECTRIC CONTROLLER & MFG. CO.
Cleveland, Ohio



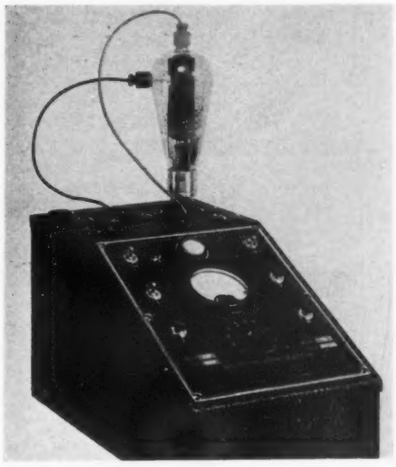
Used with single magnets or two or more magnets in parallel.

THE ELECTRIC CONTROLLER & MFG. CO. E&M CLEVELAND, OHIO

★

HEAVY DUTY MOTOR CONTROL FOR CRANE · MILL DRIVES AND MACHINERY · BRAKES · LIMIT STOP · LIFTING MAGNETS AND AUTOMATIC WELD TIM

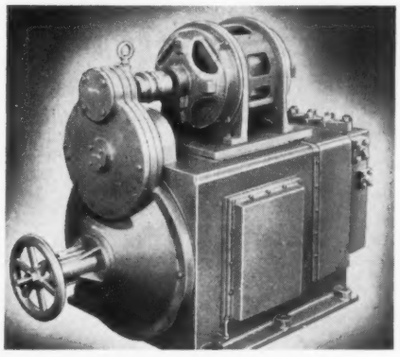
trol board, is provided with adjustments for intensity, horizontal and



vertical amplitude and focus for the oscilloscope. It operates on 110 to 120 volts, 60-cycle current.

Variable Delivery Pump

■ Watson-Stillman Co., Roselle, N. J., has placed on the market a new Stediflo, variable delivery, high pressure pump—the flow of which is infinitely variable from 0 to 6 gallons per minute at 5000 pounds per square inch pressure. It features a new driving member trunnioned on the drive shaft. It is designed so its angle can be varied while the pump is running to produce a corresponding stepless change in plunger stroke from 0 to full 4-inch stroke. The stroke control shaft of the pump extends outside of the pump casing for attachment either to a manual or automatic pressure control. Especial-



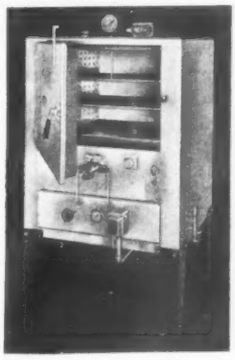
ly suited to hydraulic press applications, the pump is powered by a 25-horsepower motor.

Industrial Truck Tire

■ B. F. Goodrich Co., Akron, O., announces a large industrial truck tire capable of carrying more than 7 tons. Weighing 206 pounds, including the single-flange steel base to which it is bonded, the tire is designed for use on industrial fork and ram trucks used in steel mills for moving strip steel. Made of solid rubber, with a grooved tread construction, the tire is designated in size as 22 x 16 x 16, with the first dimension representing the overall diameter in inches, the second, the width at the junction with the steel base band, and the third, the diameter of the wheel on which it is installed by a press fit application.

Explosion-Free Cabinets

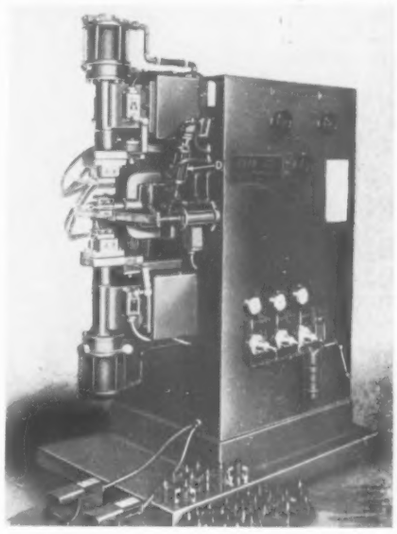
■ Precision Scientific Co., 1730 North Springfield avenue, Chicago, announces a new series of four standard sizes of explosion-proof constant temperature cabinets for use in hazardous locations. Explosion-proof features embrace complete absence of exposed contacts, electric controls, switches, or wiring terminals, so as to prevent ignition of explosive gases in the atmosphere, or inside the cabinet; safety release latches on doors, for instant opening under the pressure of an explosive burst which



might occur inside the cabinet; also special venting to exhaust dangerous gases. Steam, instead of electricity, is used for heating, and a motor-driven turbo-blower produces a forced circulation of heated air across the working chamber. Temperature range of the unit is 35 to 150 degrees Cent., automatically controlled by a pneumatic thermostat. Control accuracy is between plus or minus 2 and 3 degrees. Cabinets can be operated at any steam pressure between 0 and 100 pounds saturated. They are automatically safeguarded against excessive temperatures by a pressure release valve set to release at 100 pounds.

Projection Welder

■ Eisler Engineering Co. Inc., Newark, N. J., recently placed on the market a special No. 600-KKD air-operated projection spot welder equipped with special welding jigs and fixtures for welding fins to steel tubing. The machine features 56 heat control points and its transformer secondary, welding dies and mandrel are water cooled throughout. Pressure for each set of air cylinders can be regulated individually to meet any requirement. The machine is wired so that the ejector mechanism cannot operate while the welding dies



are in motion, nor will the welding dies operate while the ejector mechanism is in motion. Actual welding time is controlled by automatic timing equipment. Production of the machine is reported at approximately 200 finished pieces per hour.

Drum Opener

■ Turner & Seymour Mfg. Co., Torrington, Conn., announces a new Westco semiautomatic drum opener which cuts a smooth edged opening in straight-chime metal drums up

to 35 inches in height. Its corrugated cast iron base can be bolted to the floor. Four steel uprights support the cutting unit, which is counterbalanced for easy adjustment to the height of drum. After adjustment,

the cutting unit is locked in position. The drum is perforated by closing the cutting unit lever. Over-all height of the opener is 50 inches. Its use is said to eliminate injuries associated with the usual hammer-and-cold-chisel method of opening drums.

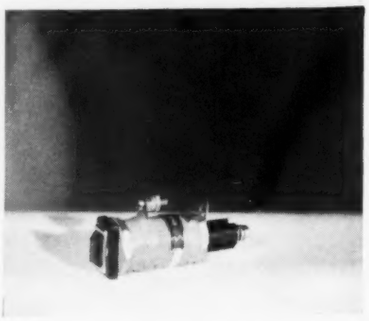
Power Control Valve

■ Consolidated Safety Valve Division, Manning, Maxwell & Moore Inc., Bridgeport, Conn., announces an Ashcroft power control valve for high pressure installations ranging from 1800 to 2500 pounds. It is an automatic relief valve that may be set for a 1 per cent or less difference between opening and closing

pressure. Its use is said to reduce maintenance expense of spring loaded safety valves. The new unit is set to open at a slightly lower pressure than any of the safety valves. It opens exactly at the popping pressure and it closes cleanly with an extremely low blow-down. High superheat temperatures have no effect on its action. It also may be operated manually from the control station.

Indicating Lamp

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has placed on the market a new Minalite indicating lamp for general indicating or signal purposes on switchboards, control desks and panel boards. It is equipped with a rectangular-shaped lens The receptacle is of one-piece molded material and is suitable for mounting on panels 1/16 to 2 inches thick. Resistors as part of the unit are used for line voltage ratings between 50 and 250 volts. Pressure type leaf spring contacts establish connections with the slide



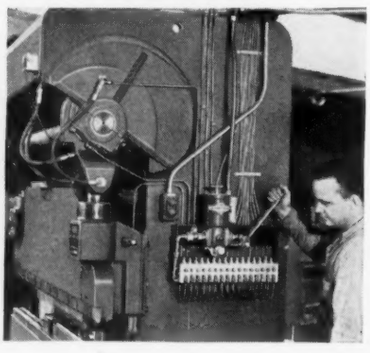
base telephone lamp having a rating of 0.032-0.038 amperes, 24 volts. The rectangular lens assembly is held in place by steel spring clips engaging in retaining grooves of the receptacle.

Power Tools

■ Chas. F. Overly Co., 1753 Rosedale avenue, Cleveland, announces a line of power tools for use in conjunction with grinding, buffing, sanding and polishing wheels. Units feature rotor-centric motor, one-piece rotor and shaft, push pin trigger type handles and a lubrication system of the controlled metal seep type. Control head, front head and handles are of aluminum alloy.

Lubricating System

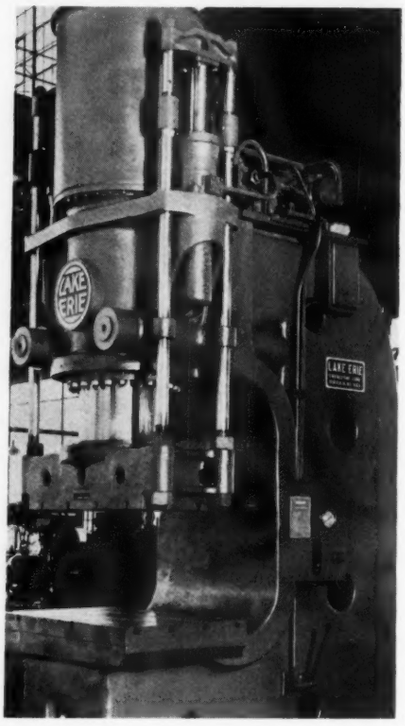
■ Lincoln Engineering Co., 5701 Natural Bridge avenue, St. Louis, has introduced an improved centralized lubricating system. It consists of a number of injectors—one for each bearing to be lubricated, each connected to the bearing by tubing or flexible high-pressure hose, and each individually adjusted to discharge required amount of



lubricant. Feature of this Centro-Matic system is the single lubricant supply line between the pumping unit and the injectors. The pumping unit on the installation illustrated, is the new 2-pound pump. It can be easily mounted on a machine. Other pumping units with 30-pound capacity, as well as pumps that handle lubricants direct from 100 and 400-pound capacity original drums also are being offered. Systems also can be either electrically operated with a push button control, or entirely automatic with a time clock control.

Plate Bending Press

■ Lake Erie Engineering Corp., Kenmore station, Buffalo, announces a 400-ton hydraulic plate bending press especially adapted for ship building use. Shown here, it is a self-contained machine with pumping unit mounted on top. Handling of work is facilitated by its gap

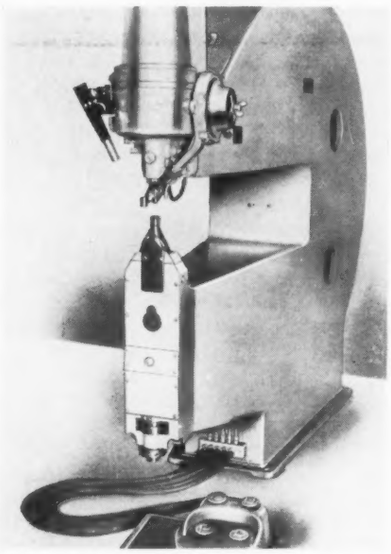


type steel C frame. The press features a 30-inch throat, 24-inch stroke and 36-inch daylight opening. It is controlled by a hand lever during bending operations.

Automatic Punching and Riveting Machine

[N] Engineering & Research Corp., [R]iverdale, Md., is now offering a new model No. 1002 Erco automatic punching and riveting machine which features a C-frame with a throat depth of 48 inches. It is said to punch and countersink holes automatically, feed and head rivets up to 3/16-inch in diameter in one continuous operation by depressing two foot buttons, five to ten times faster than the combined operations can be performed by any other methods. The unit is regularly equipped with an air-operated remote control and quick-drop anvil support operated by the same re-

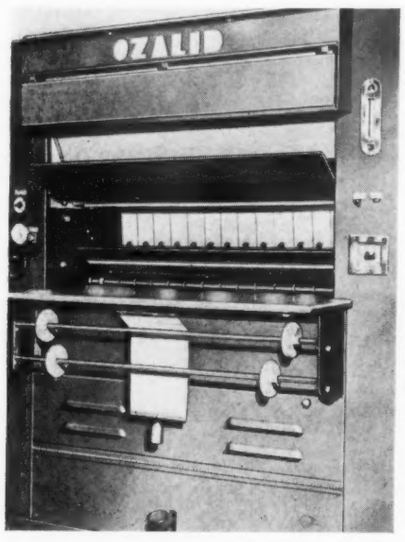
mote control unit. The control can be placed in any position. The



quick-drop anvil support operated by the same control unit provides a 4½-inch opening in the punching and riveting head for feeding and removing deeper channel sections. A special spotlight incorporated on the machine indicates where hole is to be punched.

Whiteprint Machine

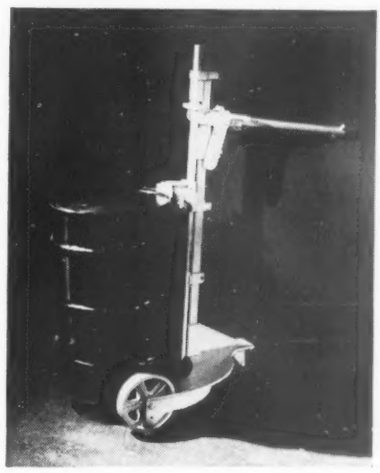
■ Ozalid Products Division, General Aniline & Film Corp., Johnson City, N. Y., has placed on the market a new model B Whiteprint machine capable of producing finished prints at speeds up to 20 feet per minute. It contains such features as synchronized printing and developing, permitting the use of continuous yardage as well as cut sheets. It also includes a temperature control for the printing cylinder, and a spe-



cial light conveniently placed above the print receiving tray to enable the operator to check prints. The machine combines printer and developer in one compact unit. Only one operator is required to handle its entire print production. The unit uses all standard sensitized materials, transparent materials including foils, and specialties—paper coated on both sides, air mail weight paper, paper laminated on cloth and opaque cloth. It can easily be installed in the drafting room, plant or office.

Drum Carrier

■ Ernst Magic Carrier Sales Co., 1456 Jefferson avenue, Buffalo, is offering a new Little Giant carrier for handling litherage drums which are principally used as containers of heavy materials. It features a simple lifting device and self-balancing tri-wheel design which is said to prevent accidents in handling. For use in powder plants or explosive areas, the truck is offered



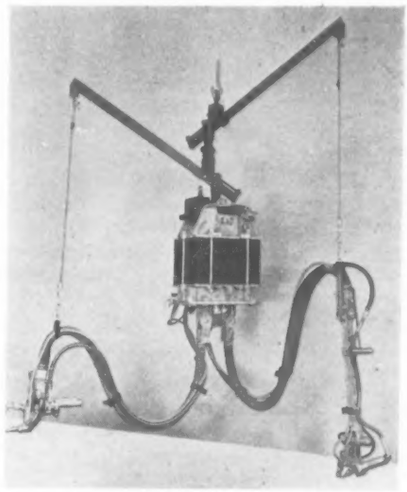
with copper silicon alloy metal wheels. It has a capacity up to 600 pounds.

Welding Torch

■ Alexander Milburn Co., 1493 West Baltimore street, Baltimore, has introduced a new type MM welding torch for use in aircraft work. Light in weight, its flame can be controlled accurately so that it can be used for intricate work. It provides best results on thicknesses of ⅛-inch and less, up to ½-inch. The torch is particularly useful with stainless steel and similar alloys.

Welding Gun Hangers

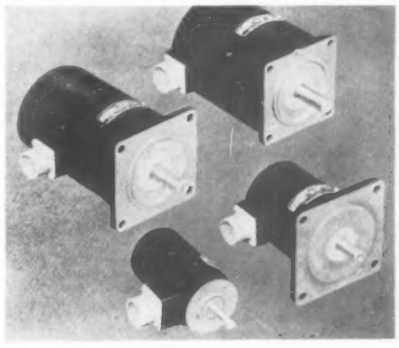
■ Progressive Welder Co., 3050 East Outer drive, Detroit, has introduced a line of compound springless, adjustable balanced hangers for use with welding guns. Of the swiveling type, each hanger permits individual counterbalancing of two separate units, such as welding guns, riveting equipment and other forms of heavier type 'hand' tools. The hangers in the line are individually adjustable for weights to



be counter-balanced. They are available in two sizes, No. 87DS9 for light and medium duty, and No. 87DS10 for heavy duty. When used with welding guns, the former will support guns and transformers up to 75 kilovolt-ampere, while the heavy duty type is designed for guns and transformers rated up to 150 kilovolt-ampere.

Motors for Aircraft

■ General Electric Co., Schenectady, N. Y., has placed on the market a complete line of motors in fractional-horsepower frame sizes, to meet requirements of aircraft service. Designated as types BA-25, 40, 50 and BC-21 and 31, these direct-current units can be furnished as series, compound, or shunt-wound motors to meet varied applications. Ratings range from 1/200-horsepower at 75 revolutions per minute, continuous, open, to 7 horsepower at 75 revolutions per minute, totally enclosed. The motors are available in five standard speeds—1750, 2800, 3800, 5800, and 7500 revolutions per min-



ute. Construction features include aluminum frames, precision balance, all ball-bearing construction, and standard Air Corps flange mountings in styles II, III and IV.

Mirrors of Motordom

(*Concluded from Page* 40)

The work is stiff to begin with, but the pay is good and the hours are not overly long.

However, a large force of contact and follow-up men is absolutely essential to the smooth flow of war material, just as it is to the orderly processing of automobiles. In fact, there are probably more people needed in this work than in civilian goods manufacture. Quality of incoming material, checking of shipments, billings, unending changes in specifications, greatly expanded inspection detail and related work require a large number of persons.

Auto Industry Long Expert At Subcontracting Methods

A considerable hullabaloo is being drummed up throughout the country on the subject of subcontracting, as though it were something new which had just been discovered to help the "primary" builders do a job more efficiently and more quickly. At the expense of seeming tedious, we would like to reproduce further remarks of Mr. Wilson of General Motors on this subject. He says:

"Subcontracting is nothing but buying parts from other people. In the automobile industry, particularly, all companies have bought parts from other people regularly. It has been a part of our business. At one stage in the industry there were some companies that did practically nothing but assembly. It used to be sort of a joke around the industry that if you just called the parts and accessories suppliers together they could design you a car in 30 days and make the pieces for you and all you need do was get a building and put the pieces together.

"It is interesting to realize that every time the government spends $3000, on the average, some man or woman has to work for a year in the U. S. Now if our company did all the work in the production of a single item you could determine roughly how many people we had working for us by dividing our dollar volume of business by 3000. But we buy materials and we subcontract so much work regularly in the business that in our case the ratio varies from about one employe for every $6000 to one for every $12,000."

New Construction Contract Money Less Than Average

With respect to charges by the Senate Defense Investigating Committee that the automobile industry had been "given millions of dollars to spend over months of time to create entirely new plant facilities instead of being required to convert a substantial part of their existing facilities to defense production," it might be pointed out that as of Sept. 30, 1941, government facilities contracts—money for new plants—totaled for all industry $4,642,000,000, and supply contracts $20,486,000, or a ratio of facilities to supply contracts of 22.6 per cent. The same comparison in the case of General Motors Corp., a typical automobile producer, was $148,000,000 for facilities against $1,528,000,000 for supplies, a ratio of 9.6 per cent.

This indicates the auto industry asked the government for less than 10 cents on each dollar's worth of war contracts undertaken, while industry as a whole asked for over 22 cents to be applied by the government for new plant facilities, for every dollar's worth of contracts undertaken.

As far as automobile production being "allowed to attain a peak nearly as great as the total manufactured in 1929" is concerned, this appears a deliberate attempt to create misconception in the public mind. Total production of cars and trucks in 1941, even including units produced for Canadian assembly, was something under 5,100,000 units, or 9.6 per cent less than the 1929 total, and only 8 per cent ahead of the total for 1940. In a year when practically all other forms of consumer goods production outran 1940 totals by considerably more than 8 per cent, it is obviously unfair to single out the automobile industry and try to make it the goat for not having as much war material now as we would like.

The truth of the matter is that the entire country is to blame if we do not have the fighting weapons now that we wish we had. It is one thing to tool up and produce complex armament, and it is another thing to wake up one day and wish for tremendous quantities that were not even thought of the day before.

It might be far better to forget past deficiencies for which no one industry, politician or political group can rightly be blamed, and buckle down to the task in hand, that of producing the materials needed in as short a time as possible.

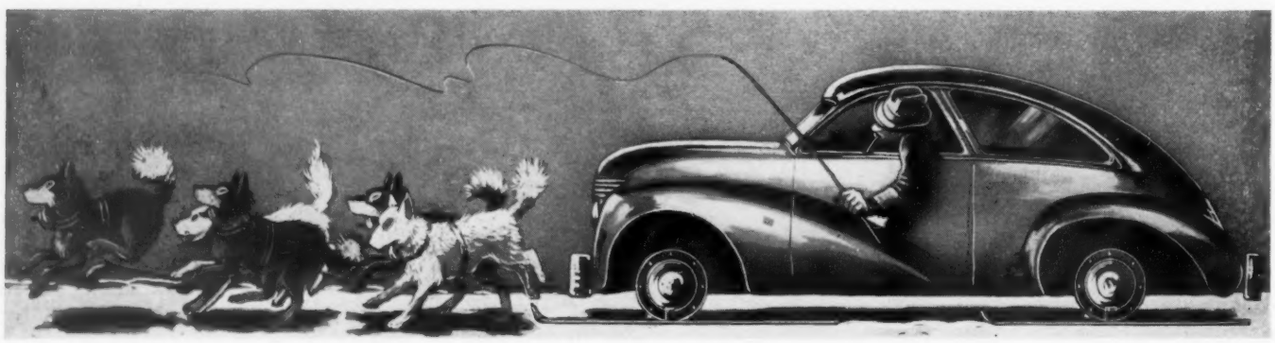
Ford Receives Additional $84,000,000 Order from Army

Additional military vehicle orders totaling nearly $84,000,000 have been received from the Army by Ford Motor Co. in the past ten days.

The orders call for various types of trucks and passenger cars, with the bulk of the amount for reconnaissance cars or "blitz buggies," as they are called.

Manufacturing facilities have been tooled up for production by the end of this month of several hundred of these small units a day. As quickly as they can be prepared, assembly branches of the company in various sections of the country will be utilized for production of these cars. Engines and chassis will be made at the Rouge plant here; bodies, gearboxes and other parts will emanate from the Lincoln plant.

For a Strong Nation — Tireless Sundays



Steel Industry Set For Full War Aid

Awaits orders from new War Production Board. Increased demand foreseen. Scrap famine continues to handicap steelmaking.

MARKET IN TABLOID ★

Demand

Civilian buying negligible.

Prices

Continue static.

Production

Down ½-point to 96 per cent.

■ LINES are being drawn tighter in the steel industry and in most products high priorities are covering production almost to the exclusion of civilian supply. Fullest co-operation by the industry is aiding government authorities charged with distribution and to the extent that steel can be produced it is being supplied to fabricators of essential war materials.

Pending whatever changes may result from formation of the War Production Board the steel industry is proceeding on the basis of OPM provisions, awaiting developments which may be deemed expedient to further the aims of maximum production. Meanwhile every means possible to keep production close to capacity is being brought into play and in spite of obstacles output is maintained at record levels. While lack of scrap continues to hamper production, many open hearths being idle for that reason, labor interruptions no longer cut into working time, which is a distinct gain, compared with last year.

Full force of the war effort is not yet apparent and the industry expects renewed demand along some lines as further plans are developed. Among expected increases is further demand for building material for additional munitions plants, army and navy bases and additions to those already built. Some of the latter already are appearing.

Pig iron supply has been sufficient for prime needs but large inventories existing when allocation started have been worked down in the meantime and larger requirements are likely in coming months to supply those formerly covered by reserves.

Plates continue in heaviest demand as ships, tanks and other war requirements absorb an increasing quantity. In an effort to supply all preferred users more strip mills are being pressed into service for plate production and many users, including builders of freight cars, are allowed to use only plates from strip mills. This releases the output of regular plate mills for purposes where specifications are important. That plates will continue to be in heavy demand is indicated by an estimate of OPM that war needs this year will total over 10,000,000 tons, a figure in excess of total plate capacity.

Production of finished steel is hampered by lack of semifinished steel supply, especially to non-integrated mills. Allocation from integrated mills to expedite production of needed steel has resulted in some cases in short supply for the latter.

Scrap supply shows no tendency to increase in spite of various efforts to gather whatever can be tempted out by local committees canvassing various cities. Currently snow and cold hamper collection and preparation and February may prove the low point. Scrap from automobiles in hands of wreckers offers a source of much tonnage and pressure is being concentrated on these in an effort to obtain the available material while allowing retention of resale parts. Wrecking of a section of elevated railroad in Boston has been ordered and will provide about 10,000 tons. Shortening of automobile assembly has reduced scrap from this source which has not yet been replaced by material from tanks and other war manufacture.

Due entirely to lack of scrap, production last week receded ½-point to 96 per cent. Youngstown made the greatest decline, 6 points, to 84 per cent. Wheeling lost 1 point to 89 per cent, Cleveland 2½ points to 90 per cent and Chicago 1 point to 101 per cent. New England gained 8 points to 100 per cent, St. Louis 5 points to 81 and Detroit 4 points to 86. Unchanged rates were maintained at Pittsburgh, 95; Eastern Pennsylvania, 89; Buffalo, 79½; Birmingham, 90 and Cincinnati, 91½ per cent.

Paralleling broken records in production of steel and iron in 1941, shipments of finished steel by the United States Steel Corp. during that year totaled 20,458,937 net tons, 36 per cent greater than in 1940 and 19 per cent above the previous all-time record in 1916. December shipments were the highest in the history of the Corporation for that month, totaling 1,846,036 tons, almost 14 per cent above those of November.

Automobile assemblies last week totaled 75,025 units, a gain of 16,035 over 58,990 made the previous week. This compares with 124,025 cars turned out in the corresponding week last year.

Composite prices are unchanged in absence of any alteration in ceiling quotations, as follows: Finished steel, $56.73; semifinished steel, $36; steelmaking pig iron, $23.05; steelmaking scrap, $19.17.

COMPOSITE MARKET AVERAGES

	Jan. 17	Jan. 10	Jan. 3	One Month Ago Dec., 1941	Three Months Ago Oct., 1941	One Year Ago Jan., 1941	Five Years Ago Jan., 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$55.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	36.20
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	22.80	19.96
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	21.00	18.45

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Jan. 17, 1942	Dec. 1941	Oct. 1941	Jan. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.17
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv. Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Jan. 17, 1942	Dec. 1941	Oct. 1941	Jan. 1941
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.34	25.34	25.34	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	19.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	23.06
No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.17
Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$22.15
Heavy melt. steel, No. 2, E. Pa.	17.75	17.87	17.75	19.31
Heavy melting steel, Chicago	18.75	18.75	18.75	20.15
Rails for rolling, Chicago	22.25	22.25	22.25	24.40
No. 1 cast, Chicago	20.00	21.33	21.50	19.35

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$5.50
Connellsville, foundry, ovens	7.25	7.25	7.25	6.00
Chicago, by-product fdry., del.	12.25	12.25	12.25	11.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. mill, carloads.

Sheets, Strip

Hot-Rolled Sheets

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 2.10c
Granite City base 2.20c
Detroit, del. 2.20c
Pacific ports 2.65c

Cold-Rolled Sheets

Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, B'ham., base 3.05c
Granite City, base 3.15c
Detroit, del. 3.15c
Other Mich. pts., del. 2.25c
Pacific ports 3.70c

Galvanized Sheets, No. 24

Pittsburgh, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c
Granite City, base 3.60c
Pacific ports 4.05c

Corrugated Galv. Sheets

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, 29 gage, per square 3.31c
Granite City 3.38c
Pacific Ports 3.73c

Culvert Sheets

Pittsburgh, Gary, Birmingham, 16-gage, not corrugated, copper steel 3.60c, copper iron 3.90c, pure iron 3.95c.

Pittsburgh, 24-gage, zinc-coated, hot-dipped, heat-treated 4.25c.

Granite City, copper steel 3.70c, copper iron 4.00c, pure iron 4.05c.

Pacific ports, copper steel 4.25c, copper iron 4.55c, pure iron 4.60c.

Enameling Sheets

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage, base 2.75c
Granite City, base 2.85c
Pacific ports 3.40c

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c
Granite City, base 3.45c
Pacific ports 4.00c

Electrical Sheets, No. 24

	Pittsburgh Base	Pacific Ports	Granite City
Field gr.	3.20c	3.95c	3.30c
Armat.	3.55c	4.30c	3.65c
Elect.	4.05c	4.80c	4.15c

Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c
Detroit, del. 2.20c
Other Mich. pts. del. 2.25c
Pacific ports 2.75c

Cold-Rolled Strip

Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c
Chicago, base 2.90c
Worcester, base 3.00c
Detroit, del. 2.90c
Other Mich. pts. del. 2.95c

Commodity C.R. Strip

Pittsburgh, Cleveland, Youngstown, base 3 tons and over 2.95c
Worcester, base 3.35c
Detroit, del. 3.05c
Other Mich. pts. del. 3.10c

Cold-Finished Spring Steel

Pittsburgh, Cleveland, base; add 20 cents for Worcester.
.26-.50 Carbon 2.80c
.51-.75 Carbon 4.30c
.76-1.00 Carbon 6.15c
Over 1.00 Carbon 8.35c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

TYPE	BARS	PLATES	SHEETS	H. R. STRIP	C. R. STRIP
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
304-20% clad	....	*18.00	19.00	....	....
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	....	....
316	40.00	44.00	48.00	40.00	48.00
317	50.00	54.00	58.00	50.00	58.00
347	33.00	38.00	45.00	33.00	42.00
403	21.50	24.50	29.50	21.25	27.00
410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
430F	19.50	22.50	29.50	18.75	24.50
431	19.00	22.00	29.00	17.50	22.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00

*Includes annealing and pickling.

Tin, Terne Plate

Tin Plate

Pittsburgh, Chicago, Gary, 100-lb. base box $5.00
Granite City $5.10

Tin Mill Black Plate

Pittsburgh, Chicago, Gary, base 29 gage and lighter 3.05c
Granite City 3.15c
Pacific ports, boxed 4.05c

Long Ternes

Pittsburgh, Gary No. 24 unassorted 3.80c
Pacific Ports 4.55c

Special Coated Mfg. Ternes

Pittsburgh, Chicago, Gary, 100-base box $4.30
Granite City $4.40

Roofing Ternes

Pittsburgh base per package 112 sheets 20 x 28 in., coating I.C.

8-lb.	$12.00	25-lb.	$16.00
15-lb.	14.00	30-lb.	17.25
20-lb.	15.00	40-lb.	19.50

Steel Plate

Pittsburgh, Chicago, Gary, Cleveland, Birmingham,

Youngstown 2.10c
Coatesville, Sparrows Point, Claymont 2.10c
Gulf ports 2.45c
Pacific Coast ports 2.65c

Steel Floor Plates

Pittsburgh 3.35c
Chicago 3.35c
Gulf ports 3.70c
Pacific Coast ports 4.00c

Structural Shapes

Pittsburgh, Bethlehem, Chicago, Buffalo, Birmingham 2.10c
St. Louis, del. 2.34c
Pacific Coast ports 2.75c

Bars

Hot-Rolled Carbon Bars

Pittsburgh, Chicago, Gary, Cleve., Birm., base 20 tons one size 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Duluth, base 2.25c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago .. 3.25c

Rail Steel Bars

Pitts., Chicago, Gary, Cleveland, Birm., base 5 tons 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago .. 3.25c

Hot-Rolled Alloy Bars

Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size 2.70c
Detroit 2.80c

Alloy S.A.E.	Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.70	3300	3.80
2500	2.55	3400	3.20
4100 .15-25 Mo.			0.55
4600 0.20-0.30 Mo.; 1.50-2.00 Ni.			1.20
5100 80-1.10 Cr.			0.45
5100 Spr. flats			0.15
6100 Bars			1.20
6100 Spr. flats			0.85
Carb., Van.			0.85
9200 Spr. flats			0.15
9200 Spr. rounds, squares			0.40
T 1300, Mn, mean 1.51-2.00			0.10
Do., carbon under 0.20 max.			0.35

Cold-Finished Carbon Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs. 2.65c
Detroit 2.70c

Cold-Finished Alloy Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 3.35c
Detroit 3.45c
Galveston, add $0.25; Pacific Coast, $0.50.

Turned, Ground Shafting

Pitts., Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c
Detroit 2.70c

Reinforcing Bars (*New Billet*)

Pitts., Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Reinforcing Bars (*Rail Steel*)

Pitts., Chicago, Gary, Cleveland, Birm., base. 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Iron Bars

Philadelphia, com. del. 3.06-3.50c
Pittsburgh, muck bar.... 5.00c
Pittsburgh, staybolt 8.00c
Terre Haute com., f.o.b. mill 2.15c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails $2.55

(Per Pound)

Polished fence staples... 2.55c
Annealed fence wire 3.05c
Galv. fence wire 3.40c
Woven wire fencing (base C. L. column) 67
Single loop bale ties, (base C. L. column)... 59
Galv. barbed wire, 80-rod spools, base column... 70
Twisted barbless wire, column 70

To Manufacturing Trade

Base, Pitts.-Cleve.-Chicago Birmingham (except spring wire at Birmingham)

Bright bess., basic wire . 2.60c
Galvanized wire 2.60c
Spring wire 3.20c
Worcester, Mass., 10c higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg $3.85

Alloy Plates (Hot)

Pitts., Chicago, Coatesville, Pa. 3.50c

Rails, Fastenings

(Gross Tons)

Standard rails, mill ... $40.00
Relay rails, base, 35 lbs. and over 28.00-30.00
Light rails, billet qual., Pitts., Chicago, Bham. $40.00
Do., rerolling quality. 39.00

Cents per pound

Angle bars, billet, mills . 2.70c
Do., axle steel 2.35c
Spikes, R. R. base 3.00c
Track bolts, base 4.75c
Do., heat treated 5.00c
Car axles forged, Pitts., Chicago, Birmingham.. 3.15c
Tie plates, base 2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller..... 65½ off
Do., 5/16 and ⅜ x 6-in. and shorter ..... 63½ off
Do., ¾ to 1 x 6-in. and shorter ..... 61 off
1⅛ and larger, all lengths 59 off
All diameters, over 6-in. long ..... 59 off
Tire bolts ..... 50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts ..... 56 off
Plow bolts ..... 65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less.	62	64
9/16-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger .	56	..

Hexagon Cap Screws

Upset 1-in., smaller ..... 60 off

Square Head Set Screws

Upset, 1-in., smaller..... 68 off
Headless, ¼-in., larger..55 off
No. 10, smaller ..... 60 off

Piling

Pitts., Chgo., Buffalo.... 2.40c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.

Structural 3.75c
7/16-inch and under.....65-5 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. .....$3.50 off

Tool Steels

Pittsburgh, Bethlehem, Syracuse, base, cents per lb.

Carb. Reg. 14.00 Oil-hardening .. 24.00
Carb. Ext. 18.00
Carb. Spec. 22.00 High car.-chr. 43.00

High Speed Tool Steels

Tung.	Chr.	Van.	Moly.	
18.00	4	1	....	67.00
18.00	4	2	1	77.00
18.00	4	3	1	87.00
1.50	4	1	8.50	54.00
..	4	2	8	54.00
5.50	4	1.50	4	57.50
5.50	4.50	4	4.50	70.00

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cutlengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	...
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	$ 7.82	$ 9.01
1¼" O.D.	13	9.26	10.67
1½" O.D.	13	10.23	11.79
1¾" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼" O.D.	13	14.54	16.76
2¼" O.D.	12	16.01	18.45
2½" O.D.	12	17.54	20.21
2¾" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Welded Iron, Steel, Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

In.	Steel Blk.	Steel Galv.
½	63½	51
¾	66½	55
1—3	68½	57½
	Iron	
¾	30	10
1—1¼	34	16
1½	38	18½
2	37½	18

Lap Weld

	Steel	
2	61	49½
2½—3	64	52½
3½—6	66	54½
7 and 8	65	52½
	Iron	
2	30½	12
2½—3½	31½	14½
4	33½	18
4½—8	32½	17
9—12	28½	12

Line Pipe, Plain Ends

	Steel
1 to 3, butt weld	68½
2, lap weld	63
2½ to 3, lap weld.....	66
3½ to 6, lap weld.....	65
7 and 8, lap weld.....	64

Seamless, 3 pts. lower discount.

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..$45.00-46.00
4-in., Birmingham.. 48.00-49.00
4-in., Chicago 56.80-57.80
6-in. & over, Cnicago 53.80-54.80
6-in. & over, east fdy. 49.00
Do., 4-in. 52.00

Class A Pipe $3 over Class B
Stnd. fltgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point..$34.00
Duluth (billets) 36.00
Detroit, delivered 36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.. 40.00
Duluth 42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago. 34.00
Detroit, delivered 36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 9/32-inch incl. (per 100 lbs.) $2.00
Do., over 9/32 to 11/64-in. incl. 2.15
Worcester up $0.10, Galveston up $0.25 and Pacific Coast up $0.50 on water shipments.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt. 1.90c

Shell Steel

Pittsburgh, Chicago, base, 1000 tons of one size, open hearth

3-12-inch $52.00
12-18-inch 54.00
18-inch and over 56.00

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.... $6.00- 6.25
Connellsville, fdry.. 7.00- 7.50
Connell. prem. fdry. 7.25- 7.60
New River fdry. .. 8.00- 8.25
Wise county fdry. .. 7.50
Wise county fur. .. 6.50

By-Product Foundry

Newark, N. J., del. 12.60-13.05
Chicago, outside del. 11.50
Chicago, delivered .. 12.25
Terre Haute, del. .. 12.00
Milwaukee, ovens .. 12.25
New England, del. .. 13.75
St. Louis, del. .. 12.02
Birmingham, ovens. 8.50
Indianapolis, del. .. 12.00
Cincinnati, del. 11.75
Cleveland, del. 12.30
Buffalo, del. 12.50
Detroit, del. 12.25
Philadelphia, del. .. 12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol.... 14.00c
Toluol, two degree 27.00c
Solvent naphtha 26.00c
Industrial xylol 26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.) 14.75c
Do. (1000 lbs. or over) 13.00c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers 7.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia $29.00

Pig Iron

No. 2 foundry is 1.75-2.25 sil.; 50c diff. for each 0.25 sil. above 2.25 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birmingham, Ala.§	20.38	.....	19.38	25.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.00	25.50	24.50	26.00
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00

§Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham†	25.61	.....	25.11	.....
Boston from Birmingham†	25.12	.....	.....	.....
Boston from Everett, Mass.	25.50	26.00	25.00	26.50
Boston from Buffalo	25.50	26.00	25.00	26.50
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O. from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.61	.....
Cincinnati from Birmingham†	24.06	.....	23.06	.....
Cleveland from Birmingham†	24.12	.....	23.12	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	.....
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	.....	.....
Newark, N. J., from Birmingham†	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham†	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....

Pittsburgh dist.: Add to Neville Island base, North and South Sides, 69c; McKees Rocks, 55c; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, 84c; Monessen, Monongahela City, $1.07; Oakmont, Verona, $1.11; Brackenridge, $1.24.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.50	.....	23.62	.....
St. Paul from Duluth	26.63	26.63	.....	27.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50, base; $30.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$28.00
Pitts. dist. fur.	23.50	do., del. Chicago	31.34
		Lyles, Tenn., high phos.	28.50

Silvery

Jackson county, O., base, 6.00 to 6.50 per cent $29.50. Add 50 cents for each additional 0.25 per cent of silicon. Buffalo base $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

Manganese differentials in silvery iron and ferrosilicon not to exceed 50 cents per 0.50 per cent manganese in excess of 1 per cent.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.35
Georgia, Alabama	38.00
New Jersey	49.00

Ohio

First quality	43.00
Intermediate	36.10
Second quality	36.00

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$31.00
Wire cut	29.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., tide, net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$25.00
Do., barge	25.00
No. 2 lump	25.00

Ferroalloy Prices

Ferromanganese, 78-82%, Carlots, duty pd., seab'd $120.00; Carlots, del. Pittsburgh 125.33; Carlots, f.o.b. So. f'ces. 140.00. Add $10 for ton, $13.50 for less ton, $18 for less than 200-lb. lots.

Spiegeleisen, 19-21%, gross ton, Palmerton $36.00

Manganese Briquets, Contract carloads, bulk freight allowed, per lb. 5.50c; Packed 5.75c; Ton lots 6.00c; Less-ton lots 6.25c; Less 200 lb. lots 6.50c. Spot ¼c higher.

Manganese Electro, 99.9+%, less car lots 42.00c

Chromium Metal, per lb. contained chromium

	Contract	Spot
98% Cr. ton lots	80.00c	85.00c
88% Cr. ton lots	79.00c	84.00c

Ferrocolumbium, 50-60% f.o.b. Niagara Falls, per lb. contained Cb on contract $2.25; Less-ton lots 2.30 (Spot 10c higher)

Chromium Briquets, per lb., freight allowed

	Contract	Spot
Carlots	8.25c	8.50c
Packed	8.50c	8.75c
Ton lots	8.75c	9.00c
Less-ton lots	9.00c	9.25c
Less 200 lbs.	9.25c	9.50c

Ferrochrome, 66-70%, freight allowed, 4-6% carbon, per pound contained (chrome) Carloads 13.00c; Ton lots 13.75c; Less-ton lots 14.00c

Less than 200-lb. lots 14.25c

67-72%, low carbon, cts. per pound:

	Car loads	Ton lots	Less ton	Less 200 lbs.
2% C.	19.50	20.25	20.75	21.00
1% C.	20.50	21.25	21.75	22.00
0.20% C.	21.50	22.25	22.75	23.00
0.10% C.	22.50	23.25	23.75	24.00

Spot is ¼c higher.

Ferromolybdenum, 55-75%, per lb. contained molybdenum, f.o.b. furnace 95.00c

Calcium Molybdate (Molyte), 40-45% Mo., per lb. contracts, f.o.b. producers plant 80.00c

Molybdic Oxide Briquets, 48-52% Mo. per lb. contained, f.o.b. producers plant 30.00c

Molybdenum Oxide, (In 5 and 20 lb. mo. contained cans) 53-63 mo. per lb. contained f.o.b. producers' plants 80.00c

Molybdenum Powder, 99%, f.o.b. York, Pa., per lb. in 200-lb. kegs $2.60; Do., 100-200 lb. lots 2.75; Do., under 100-lb. lots 3.00

Ferrophosphorus, 17-19%, gross ton carloads, f.o.b. sellers' works, $3 unitage, freight equalized with Rockdale, Tenn. for 18% phos. Contract $58.50; Spot 62.25

23-26%, $3 unitage, freight equalized with Mt. Pleasant, Tenn., for 24% phos. Contract 75.00; Spot 80.00

Ferrosilicon, Gross tons, freight allowed, bulk

	Carloads	Ton lots
50%	$ 74.50	$ 87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

(Above for contracts; spot ¼c higher)

Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):

	1% Iron	2% Iron
Carlots	14.50c	13.00c
Ton lots	15.00c	13.50c
Less-ton lots	15.25c	13.75c
Less 200 lbs.	15.50c	14.00c

Silicon Briquets, Contract carloads, bulk freight allowed, per ton $74.50; Packed 80.50; Ton lots 84.50; Less-ton lots, per lb. 4.00c; Less 200-lb. lots 4.25c. Spot ¼c higher on less ton lots; $5 higher on ton lots and over.

Silicomanganese,

Carbon	1½%	2½%
Carloads (contract)	$128.00	$118.00
Ton Lots (contract)	140.50	130.50

Freight allowed spot $5 above contract

Ferrotungsten, (All prices nominal) Carlots, per lb. contained tungsten $1.90

Tungsten Metal Powder, (Prices Nominal) 98-99 per cent, per pound, depending upon quantity $2.60-$2.65

Ferrotitanium, 40-45%, f.o.b. Niagara Falls, per lb. contained in ton lots $1.23

Less ton lots 1.25

20-25%, C. 0.10 max., in ton lots per lb. contained Ti 1.35; Less-ton lots 1.40 (Spot 5c higher)

Ferro-Carbon-Titanium, 15-20% Titanium,

	6-8% C	3-5% C
Carlots, contract, f.o.b. Niagara Falls, freight allowed to destinations east of Mississippi and north of Baltimore and St. Louis	$142.50	$157.50

Ferrovanadium, 35-40%, contract per pound contained vanadium $2.70-$2.80-$2.90 (Spot 10c higher)

Vanadium Pentoxide, Per lb. contained, contracts $1.10; Do., spot 1.15

Zirconium Alloy, 12-15%, carloads, contract, bulk $102.50; Packed 107.50; Ton lots 108.00; Less ton lots 112.50. Spot $5 a ton higher

35-40%, contract, carloads, bulk or package, per lb. alloy 14.00c; Do., ton lots 15.00c; Do., less-ton lots 16.00c. Spot is ¼-cent higher

Alsifer, Per lb., f.o.b. Niagara Falls.

	Contract	Spot
Carlots	7.50c	8.00c
Ton lots	8.00c	8.50c

Simanal, Per lb. of alloy, contracts, freight allowed (approx. 20% Si, 20% Mn, 20% Al)

Carlots	Ton Lots	Ton Lots
10.50c	11.00c	11.50c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1941

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.48	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.00	4.92	3.47	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.49	4.49	6.09	4.19	....	5.54	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	3.75	5.95	5.95	3.85	3.85	5.50	4.20	....	5.25	....	6.90	....	....
Seattle	4.35	4.35	....	4.35	4.35	5.35	4.25	7.70	5.60	....	5.75	....	....
Portland, Oreg.	4.60	4.85	6.45	4.35	4.35	6.10	4.30	6.85	5.35	....	5.75	....	....
Los Angeles	4.50	5.00	6.80	4.50	4.50	6.75	4.65	6.50	5.85	....	6.60	10.55	9.55
San Francisco	4.10	4.60	6.35	4.25	4.25	5.95	4.25	6.40	6.00	....	6.80	10.80	9.80

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.75	9.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	5.60	9.80	8.80	8.65	9.05

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	£ s d
Merchant bars, 3-inch and over	$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.95c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	3.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1 10 9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		£ s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79	6 8 0(a)
Basic pig iron	24.28	6 0 6(a)
Furnace coke, f.o.t. ovens	7.40	1 16 9
Billets, basic soft, 100-ton lots and over	49.37	12 5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14 10 6
Merchant bars, rounds and squares, under 3-inch	3.17c	17 12 0††
Shapes	2.77c	15 8 0††
Ship plates	2.91c	16 3 0††
Boiler plates	3.06c	17 0 6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22 15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26 2 6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23 15 0
Bands and strips, hot-rolled	3.30c	18 7 0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Chinese wolframite, net ton, duty pd.	$24.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c

F.O.B. Rio Janeiro.

Scheelite, imp.	23.50-24.00
Chrome ore, Indian, 48% gross ton	.....

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	.....
So. African, 50%	68.00-70.00
Indian, 50%	68.00-70.00
Brazilian, 46%	68.00-70.00
Chilean, 47%	68.00-70.00
Cuban, 50-51%, duty free	.....

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted de livered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

(Gross Tons)

OTHER THAN RAILROAD GRADES	*Pittsburgh	Johnstown, Pa. Sharon, Canton, O.	Steubenville	Youngstown	Warren	Weirton	Cleveland	Cincinnati	Middletown	Portsmouth	Ashland, Ky.	Buffalo	Claymont, Del.	Coatesville	Conshohocken, Pa.	Harrisburg	Phoenixville, Pa.
Open Hearth	20.00	20.00	20.00	20.00	20.00	20.00	19.50	19.50	19.50	19.50	19.50	19.25	18.75	18.75	18.75	18.75	18.75
Machine Shop Turnings	16.00	16.00	16.00	16.00	16.00	16.00	15.50	15.50	15.50	15.50	15.50	15.25	14.75	14.75	14.75	14.75	14.75
Blast Furnace	16.00	16.00	16.00	16.00	16.00	16.00	15.50	15.50	15.50	15.50	15.50	15.25	14.75	14.75	14.75	14.75	14.75
Elec. furnace and foundry	25.00	25.00	25.00	25.00	25.00	25.00	24.50	24.50	24.50	24.50	24.50	24.25	23.75	23.75	23.75	23.75	23.75
Low phos billet, bloom, forge crops	22.50	22.50	22.50	22.50	22.50	22.50	22.00	22.00	22.00	22.00	22.00	21.75	21.25	21.25	21.25	21.25	21.25
Low phos bar crops and smaller	22.50	22.50	22.50	22.50	22.50	22.50	22.00	22.00	22.00	22.00	22.00	21.75	21.25	21.25	21.25	21.25	21.25
Low phos punchings and plate scrap	22.50	22.50	22.50	22.50	22.50	22.50	22.00	22.00	22.00	22.00	22.00	21.75	21.25	21.25	21.25	21.25	21.25
Heavy cut structural, plate, 3 feet, under	21.00	21.00	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.50	20.25	19.75	19.75	19.75	19.75	19.75
Heavy cut structural, plate, 2 feet, under	21.50	21.50	21.50	21.50	21.50	21.50	21.00	21.00	21.00	21.00	21.00	20.75	20.25	20.25	20.25	20.25	20.25
Heavy cut structural, plate, 1 foot, under	22.00	22.00	22.00	22.00	22.00	22.00	21.50	21.50	21.50	21.50	21.50	21.25	20.75	20.75	20.75	20.75	20.75
Cut automotive steel scrap, 3 feet, under	20.00	20.00	20.00	20.00	20.00	20.00	19.50	19.50	19.50	19.50	19.50	19.25	18.75	18.75	18.75	18.75	18.75
Cut automotive steel scrap, 2 feet, under	20.00	20.00	20.50	20.50	20.50	20.50	20.00	20.00	20.00	20.00	20.00	19.75	19.25	19.25	19.25	19.25	19.25
Cut automotive steel scrap, 1 foot, under	21.00	21.00	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.50	20.20	19.75	19.75	19.75	19.75	19.75
Alloy free low phos, sulphur turnings	18.00	18.00	18.00	18.00	18.00	18.00	17.50	17.50	17.50	17.50	17.50	17.25	16.75	16.75	16.75	16.75	16.75
First cut heavy axle and forge turnings	19.50	19.50	19.50	19.50	19.50	19.50	19.00	19.00	19.00	19.00	19.00	18.75	18.25	18.25	18.25	18.25	18 25
Electric furnace bundles	21.00	21.00	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.50	20.25	19.75	19.75	19.75	19.75	19.75

	Sparrows Point, Md.	Chicago	Bethlehem	Kokomo	Duluth	Detroit	Toledo	St. Louis	Atlanta	Alabama City	Birmingham	Los Angeles	Pittsburg, Calif.	San Francisco	Minnequa, Colo.	Seattle	Portland
Open Hearth	18.75	18.75	18.25	18.25	18.00	17.85	. .	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	14.50	....
Machine Shop Turnings	14.75	14.75	14.25	14.25	14.00	13.85	13.85	13.50	13.00	13.00	13.00	13.00	13.00	13.00	12.50	10.50	.....
Blast Furnace	14.75	14.75	14.25	14.25	14.00	13.85	13.85	13.50	13.00	13.00	13.00	13.00	13.00	13.00	12.50	10.50	.....
Elec. furnace and foundry	23.75	23.75	23.25	23.25	23.00	22.85	.....	22.50	22.00	22.00	22.00	22.00	22.00	22.00	21.50	19.50	....
Low phos billet, bloom, forge crops	21.25	21.25	20.75	20.75	20.50	20.35	.....	20.00	19.50	19.50	19.50	19.50	19.50	19.50	19.00	17.00	15.50
Low phos bar crops and smaller	21.25	21.25	20.75	20.75	20.50	20.35	.....	20.00	19.50	19.50	19.50	19.50	19.50	19.50	19.00	17.00	15.50
Low phos punchings and plate scrap	19.75	19.75	19.25	19.25	19.00	18.85	.....	18.50	18.00	18.00	18.00	18.00	18.00	18.00	17.50	15.50	14.00
Heavy cut structural, plate, 3 feet, under	20.25	20.25	19.75	19.75	19.50	19.35	.....	19.00	18.50	18.50	18.50	18.50	18.50	18.50	18.00	16.00	14.50
Heavy cut structural, plate, 2 feet, under	20.75	20.75	20.25	20.25	20.00	19.85	.....	19.50	19.00	19.00	19.00	19.00	19.00	19.00	18.50	16.50	15.00
Heavy cut structural, plate, 1 foot, under	18.75	18.75	18.25	18.25	18.00	17.85	.....	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	14.50	13.00
Cut automotive steel scrap, 3 feet, under	19.25	19.25	18.75	18.75	18.50	18.35	.....	18.00	17.50	17.50	17.50	17.50	17.50	17.50	17.00	15.00	13.50
Cut automotive steel scrap, 2 feet, under	19.75	19.75	19.25	19.25	19.00	18.85	.....	18.50	18.00	18.00	18.00	18.00	18.00	18.00	17.50	15.50	14.00
Cut automotive steel scrap, 1 foot, under	16.75	16.75	16.25	16.25	16.00	15.85	.....	15.50	15.00	15.00	15.00	15.00	15.00	15.00	14.50	12.50	11.00
Alloy free low phos, sulphur turnings	18.25	18.25	17.75	17.75	17.50	17.35	.....	17.00	16.50	16.50	16.50	16.50	16.50	16.50	16.00	14.00	12.50
First cut heavy axle and forge turnings	19.75	19.75	19.25	19.25	19.00	18.85	.....	18.50	18.00	18.00	18.00	18.00	18.00	18.00	17.50	15.50	14.00
Electric furnace bundles																	

*Includes Brackenridge, Butler, Monessen, Midland, Pa.

GRADES ORIGINATING FROM RAILROADS	*Pittsburgh	Youngstown	Cincinnati, Cleveland, Middletown, O. Ashland, Ky.	Los Angeles, San Francisco	Birmingham	Buffalo	Chicago	Detroit	Duluth	Kansas City, Mo.	Kokomo, Ind.	Philadelphia	Portsmouth, O.	Seattle, Wash.	Sparrows Pt., Md.	St. Louis	Wilmington, Del.
No. 1 Railroad Heavy Melting	21.00	21.00	20.50	18.00	18.00	20.25	19.75	18.85	19.00	17.00	19.25	19.75	20.50	15.50	19.75	18.50	19.75
Scrap Rails	22.00	22.00	21.50	19.00	19.00	21.25	20.75	19.85	20.00	18.00	20.25	20.75	21.50	16.50	20.75	19.50	20.75
Rails for Rerolling	23.50	23.50	23.00	20.50	20.50	22.75	22.25	21.35	21.50	19.50	21.75	22.25	23.00	18.00	22.25	21.00	22.25
Scrap Rails, 3 ft., under	24.00	24.00	23.50	21.00	21.00	23.25	22.75	21.85	22.00	20.00	22.25	22.75	23.50	18.50	22.75	21.50	22.75
Scrap Rails, 2 ft., under	24.25	24.25	23.75	21.25	21.25	23.50	23.00	22.10	22.25	20.25	22.50	23.00	23.75	18.75	23.00	21.75	23.00
Scrap Rails, 18-in., under	24.50	24.50	24.00	21.50	21.50	23.75	23.25	22.35	22.50	20.50	22.75	23.25	24.00	19.00	23.25	22.00	23.25

*Includes Wheeling, Steubenville, Sharon, Canton.

Maximum Price at Shipping Point. Where the shipment of the scrap to the consumer is wholly or partially by rail, or vessel, or combination of rail and vessel, the scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel for shipment to the consumer.

Where shipment of the scrap to the consumer is solely by motor vehicle, the scrap is at its shipping point when it has been loaded on such vehicle.

The shipping point price for grades 1 of cast iron scrap at the following shipping points in the United States shall be:

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	14.00	15.00	16.00
Heavy Breakable Cast	16.50	17.50	18.50
Charging Box Size Cast	17.25	18.25	19.25

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes all states not named in groups A and B.

Maximum Price Delivered to a Consumer. Scrap is at its point of delivery to a consumer when it has arrived for unloading at the plant of the consumer.

Open Hearth grades refer to No. 1 Heavy Melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers No. 2 bundles and No. 1 busheling.

Blast Furnace grades refer to mixed borings and turnings, shoveling turnings, No. 2 busheling and cast iron borings.

On open hearth grades, blast furnace grades, electric furnace and foundry grades the maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. In no case is any grade deemed by buyer or seller or both to be superior to any grade listed above but sold at a premium above the corresponding listed grade except upon approval by the OPA. No special preparation charges may in any case be added to the prices listed above.

On electric furnace and foundry grades whenever any of these grades is purchased for open hearth or blast furnace consumption the price paid, therefore, may not exceed the price listed herein for the corresponding open hearth grade.

No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage; the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or subbroker, or with the consumer. No commission is payable to a person for scrap which he prepares. No person who has not acted as a broker prior to April 3, 1941 is allowed a brokerage commission.

Sheets, Strip

Sheet & Strip Prices, Page 96

The result of more steel sheet fabricators taking on defense contracts, prime and subdivisions, prospective buyers are more numerous, shops in some instances inquiring for far more tonnage than usual. New purchasers without high ratings, however, are unable to place much volume and regular customer orders with low ratings are being entered without definite promise of delivery. Substantial demand for black sheets has developed and top priorities are promised late February delivery, several producers taking 75 and 100 ton lots. Producers of small stampings are still actively seeking defense work, all capacity being far from engaged, although inventories are low and defense contracts are required for replacements. Small tank fabricators supplying the household trade are feeling the pinch also. Galvanized and corrugated finishes are tight, but on the former scattered suppliers can ship in about eight weeks on top ratings, dependent on rolling and galvanizing schedules. Orders for sheets are also being frequently accepted tentatively pending receipt of official priority-ratings before being formally entered with the mill, and, when the latter are delayed, as is often the case, confusion and lags result.

Incoming orders for narrow cold-rolled strip are slightly ahead of last month, more rated volume offsetting declines in the civilian industries. Shipments continue ahead of bookings. Producers are diverting tonnage cancelled by the automobile trade to other channels, but are hampered by lack of priorities in some instances. Hot strip replacements are less certain and limited to rated volume, the lack of semifinished steel curtailing rolling operations. Only with an A-10 rating or better are producers able to ship or fabricators to use stainless, readjustments from chromium controls adding to confusion.

Plates

Plate Prices, Page 96

Steel plates continue to reflect pressure of war demand more than any other major product. Some producers of sheared plates are shipping little this month under A-1-a rating and in submitting their February schedules to Washington list the greater part of their tonnage at that level. An eastern producer has about 90 per cent of its production in these brackets.

No easing is in early prospect. It is understood OPM estimates the year's requirements of five groups, not included lease-lend, but including Army, Navy, Maritime Commission and railroads, at 10,000,000 tons, which is well in excess of present capacity.

OPM is taking further measures to restrict car builders' requirements solely to universal and strip mill plates. Some producers are

Less Fatigue • Power Driving • Fewer Operations = 50% Less Assembly Cost with Phillips Screws

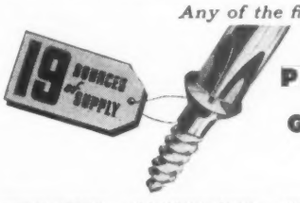
Yesterday — slow, painstaking slotted screw driving with plenty of muscle and plenty of care to see that the driver blade stayed in the slot. Plus plenty of time per assembly charged on the cost sheet.

Today — fast driving with the Phillips Screw that clings to the driver and prevents driver slippage. Faster driving methods are safe — more jobs where electric and pneumatic drivers can be employed. In the average case, Phillips Screws cut assembly time *in half!*

Add up the savings—this 50% reduction in time, the better work done by men less fatigued, the elimination of extra operations (including refinishing scratched surfaces), the freedom from crooked screws and split screw heads—and you'll find you have a 50% saving in assembly *cost* as well as valuable assembly *time*.

Please your men and your cost accountant by changing to Phillips. They are easy as pie to drive — and make every assembly dollar do twice the work.

Any of the firms listed below will tell you more



PHILLIPS RECESSED HEAD SCREWS GIVE YOU 2 for 1 (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS • SCREWS WITH LOCK WASHERS

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338. Other Domestic and Foreign Patents Allowed and Pending.

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N.H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N.Y.
Pawtucket Screw Co., Pawtucket, R.I.
Pheoll Manufacturing Co., Chicago, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N.H.

notifying carriers and carbuilders of width tolerances on these types of plates. Except for locomotive fireboxes and possibly some other special applications railroad equipment builders will be restricted to the use of these plates. To speed production, some mills with more finishing than steelmaking capacity are being supplied semifinished steel by other makers. Plate mills are working as many turns as steel supply will permit.

Some complaint by platemakers is heard, to the effect that railroad hauls are becoming excessive because OPM allocations are not placed with mills closest to points of delivery. Efforts to correct this condition have been difficult in view of pressing demand for delivery.

A 16-way shipyard to be constructed by the navy department and operated by Bethlehem Shipbuilding Corp., for mass construction of one type of escort vessel will be built at Weymouth Back river, Hingham, Mass., adding materially to the already heavy fabrication of plates for shipbuilding in New England. The plant will be temporary to meet the war emergency and will be designed to accomplish the record of the famous Squantum yards, Quincy, Mass., of World War I, where a record for speed in destroyer building was established which still stands.

Plate shipments to yards under allocation are heavy, deliveries thus far this month deviating slightly from the original schedules, which after usual adjustments, generally favor shipbuilders or shops supplying equipment to yards. Floor plates, now under allocation also, are active with deliveries averaging around 10 weeks or slightly better. While ships account for most floor plate volume, some attractive industrial tonnage is also being bought. Small tank shops, using light material normally for underground gasoline and fuel oil storage, are seeking defense contracts.

Bars

Bar Prices, Page 97

A current feature in the steel bar market which promises to tighten the situation materially within a short time is demand for shell steel. Increasing tonnage is being involved in this war requirement, which threatens to curtail shipments to preferred industries, including agricultural implements and cold-drawn steel. An indication of the requirements for shell production is seen in current inquiry for navy projectiles which will require several thousand tons of rounds. Included are 5,000,000 forty-millimeter A. A. projectiles, bids Jan. 20; 100,000,000 twenty-millimeter projectiles, bids Jan. 28; 120,000 five-inch 51 common projectiles and 50,000 five-inch 38 common projectiles, bids Jan. 27, to bureau of ordnance, Navy department, Washington.

Demand is high for alloy steel bars, all for defense. Arm needs are offsetting the decline in automotive specifications. Forgers are operating at capacity, with practically all production for war.

Cold bar drawers will be put on an allocation basis Feb. 1. This action originally was scheduled for Jan. 1 and later set for April 1. Allocations will be made monthly on the basis of their average consumption during the first seven months of 1941 but with supply to be furnished by mills supplying them in 1940. The cold drawers will be answerable directly to Washington as to use of such tonnage.

Alloy bar requirements for small caliber projectiles are heavy, large contracts being placed with New England shops for many thousands, including 20-mm. Contracts are held by a large builder of textile mill equipment in the Worcester district and a manufacturer of sporting goods; other are being negotiated. Most equipment in that area is not adapted to large shell production; that available is largely engaged in forgings for the aircraft industry, including a Springfield, Mass., shop normally producing heavily for the automobile industry. A Boston shop is machining large-diameter shells with the forging done elsewhere.

Pipe

Pipe Prices, Page 97

Given choice of basing quotas on first quarter receipts of 1940 or on one-fourth of receipts for the entire year, 1940, most pipe distributors favor the latter. Where they do not indicate a preference quotas will be based on the former.

Under the present ruling quotas are set at 80 per cent of the base quantity, against their A-9 rating and they may receive up to 110 per cent if producers can furnish that much. Producers are not obliged to furnish resellers even 80 per cent if they have too much higher rated tonage.

Indications are that at least 80 per cent can be shipped to most resellers. Tonnage obtained against the 30 per cent margin probably will require rating higher than A-9, applying to some specific emergency tonnage. Distributor stocks are low but mill shipments generally are sufficient to meet consumer demand.

Phillips Petroleum Co. plans a 900-mile natural gas pipe line from Texas to Wisconsin, with a subsidiary, Wisconsin Gas Transmission Co., having received a conditional order from Wisconsin public service commission to build the line.

Cancellation of an order for 8000 tons of cast iron pipe on books of an eastern foundry for delivery to the Philippines, because of war conditions, will release an equivalent tonnage of pig iron for other purposes. An inquiry for several thousand tons of cast pipe for Panama is before the trade.

Distributors of larger diameters of lap-weld steel pipe to the industrial field are moving stocks briskly, but there is a decline in demand for plumbing supply. Inventories with most re-sellers are well below last year; turnover is more rapid, but mills are keeping reserves down to about one month's supply. Demand for conduit is also active and there is a slight improvement in galvanized deliveries by some mills.

CAST PIPE PLACED

200 tons or more, 2 to 8-inch, Glenwood district, Eugene, Oreg., to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, 16-inch, Watertown, Mass., arsenal line, to Warren Pipe Co., Everett, Mass.

STEEL PIPE PENDING

Unstated tonnage, 200 16-foot lengths, 20-inch i.d. steel shore pipe of $\frac{5}{16}$-inch plates for dredge Welatka; bids Jan. 21, United States engineer, Jacksonville, Fla. inv. 255.

Wire

Wire Prices, Page 97

Wire mills being limited to 50 per cent of first quarter, 1940, tin allocations are confronted with production problems involving tin-bearing specialties, notably book-binding wire. Substitutes may be satisfactory on some coarser products normally tinned, painting and lacquering being likely, but processing required in book wire makes this doubtful. The base quarter on which tin allocation is made mills covers a subnormal volume with most of the industry, having processed a large part of the tonnage moved during that period during the last quarter, 1939. Mills are already experimenting with rust-retarding finishes with book-binding wire, seeking a substitute for tin.

Purchase of 240,000 kegs of nails has been made by the construction division of the Army in preparation for new defense construction in connection with the enlarged army. The contracts are widely distributed with a view to obtaining as early delivery as possible. This will engage nail capacity to the limit for several weeks.

Although some independent wire mills this month will produce less finished steel than last, incoming volume holds to the recent rate with the trend heavier for rated tonnage, more than balancing the downward move in other directions. Shipments as a rule are slightly in excess of bookings. Stranding equipment at rope mills is engaged at capacity with mills doing a good job in maintaining a steady flow of wire for high-rated tonnage, most being included in that category. Although heavily sold ahead, wire to rope departments is less tight than six months ago. Unbalanced supply of rods is the major production handicap, enhanced by a wave of specifications and analysis changes brought about by tin, chromium and other alloy controls and allocations. Nail machines are at capacity where ample supplies of wire are available, government requirements taking most production at the expense of distributor inventories. Uncertain flow of semifinished is also complicated by lend-lease demand which crops up from time to time.

Rails, Cars

Track Material Prices, Page 97

Additional inquiry for freight cars and locomotives is coming out, placing a further load on builders, whose backlogs carried over from last year are heavy. Atlantic Coast Line is taking bids on 2000 cars of various types and Chicago, Rock Island & Pacific on 775. New York Central is preparing a list of additional cars and locomotives, the latter including both steam and diesel-electric. Some export business is before the trade, including eight 40-ton tank cars for the Atlantic Refining Co. for use in Brazil, and eight 40-ton diesel-electric locomotives for the Chilean Nitrate Sales Corp., awarded to General Electric Co.

CAR ORDERS PLACED

Baltimore & Ohio, 100 caboose cars, to own shops.

CAR ORDERS PENDING

Atlantic Coast Line, 2000 cars, including 1100 fifty-ton auto-box cars, 400 fifty-five-ton twin hopper cars, 300 fifty-ton high side gondolas, 100 seventy-ton covered phosphate cars and 100 fifty-ton flat cars; bids asked.

Atlantic Refining Co., 8 forty-ton tank cars; for export to Brazil.

Chicago, Rock Island & Pacific, 775 freight cars, including 300 fifty-ton auto-box cars, 300 fifty-ton flat cars, 150 fifty-ton twin hopper cars and 25 seventy-ton covered hopper cars; bids asked.

Detroit, Toledo & Ironton, 70 fifty or seventy-ton gondolas, and 50 fifty-ton flat cars; bids asked.

Rubber Reserve Co., 50 fifty-ton tank cars; pending.

LOCOMOTIVES PLACED

Chesapeake & Ohio, 15 steam switching locomotives, 0-8-0 type, to Lima Locomotive Works, Lima, O., at cost of $1,257,000.

Chilean Nitrate Sales Corp., eight forty-ton diesel-electric locomotives, to General Electric Co., Schenectady, N. Y.

LOCOMOTIVES PENDING

New York Central, steam and diesel-electric locomotives, contemplated.

Structural Shapes

Structural Shape Prices, Page 97

Structural fabricators are booking relatively little new tonnage, due largely to restrictions on private construction, and expected increased demand for expanded war needs has not yet reached the contract stage. Most old contracts have been cleared and shops are in excellent position to handle new war requirements as they appear. Eight weeks delivery and erec-

SHAPE AWARDS COMPARED

	Tons
Week ended Jan. 17	17,718
Week ended Jan. 10	36,562
Period ended Dec. 31	21,986
This week, 1941	53,548
Weekly average, 1942	27,140
Weekly average, 1941	27,373
Weekly average, Dec. 1941	17,619
Total, 1941	78,928
Total, 1942	54,280

Includes awards of 100 tons or more.

Improve Your Safety Record *with good chain carefully maintained*

One of our customers has followed this straight road to better safety records:

The company has standardized on AMERICAN CHAIN.

The capacity of each chain is indicated by the color of the hook or pear. Green for 25-ton chain, yellow for 20-ton, red for 2-ton—and others.

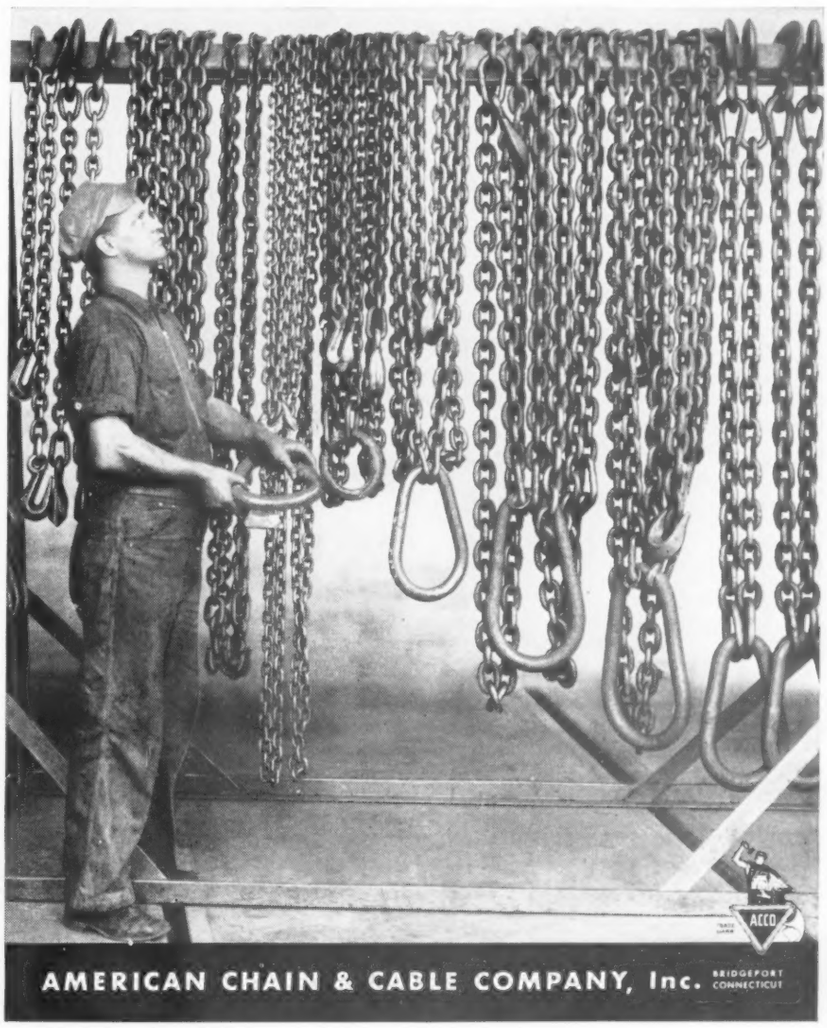
Colors and corresponding capacities are painted on the leg of the chain rack.

Check-ups are frequent, repairs prompt.

These and similar precautions will increase the service life of sling chain. We'll back this vitally important program with the best chain we've ever built.

This way of handling chain also saves time in putting chains away and locating them for the next job. Stored this way chains are easy to inspect and maintain.

AMERICAN CHAIN DIVISION • YORK, PENNSYLVANIA



AMERICAN CHAIN & CABLE COMPANY, Inc. BRIDGEPORT CONNECTICUT

tion, with top allocation on plain material, is specified on a 1000-ton contract for pier facilities at the Newport, R. I., naval station. Other war work in New England includes a gear plant at Lynn, Mass., requiring 1900 tons and additional tonnage for power station facilities at Everett, Mass., 400 tons in addition to 5000 already awarded.

SHAPE CONTRACTS PLACED

3000 tons, steel sheet piling, Floyd Bennett Field, New York, divided between Bethlehem Steel Co. and Carnegie-Illinois Steel Corp., through White Construction Co., Underpinning & Foundation Co. and Riggs Distler & Co., New York, joint contractors; project may take 3000 tons additional later.

2085 tons, flight hangar, Rome, N. Y., to American Bridge Co., Pittsburgh; Turner Construction Co., New York, contractor.

1900 tons, addition, gear plant, General Electric Co., Lynn, Mass., to American Bridge Co., Pittsburgh.

1787 tons, inert storehouses, Hawthorne, Nev., for navy, to Columbia Steel Co., San Francisco; William P. Neil Co., contractor.

1300 tons, magnesium plant, Dow Chemical Corp., Velasco, Tex., to Mosher Steel Co., Dallas, Tex.; Stone & Webster Engineering Corp., Boston, contractor, 200 tons, awarded American Bridge Co., Pittsburgh.

LEVINSON STEEL

Announcing our appointment as

NATIONAL DISTRIBUTORS

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APS

ASPHALT PROTECTED STEEL

ROOFING & SIDING

We have been appointed by Protected Steel Products Co. as National Distributors for this modern new roofing and siding material. Especially processed with a bituminous plastic coating to withstand the elements, APS Roofing and Siding will be found ideally adapted to use in the severe cold climate of Alaska or the more torrid temperatures of the Panama Canal Zone. • Write for particulars about its use in your current industrial expansion program. • Samples on request.

1

LEVINSON STEEL SALES CO.

Warehouse and Specialty Steel Products

33 PRIDE STREET · PITTSBURGH, PA.

1220 tons, additional unit for McKiernan-Terry Corp., Harrison, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through Deekman-Wells Co., Newark, N. J.

1200 tons, bridge work, various locations, for Atchison, Topeka & Santa Fe railway, to American Bridge Co., Pittsburgh; bids Dec. 19.

843 tons, state highway bridge, Parlers, Orangeburg county, South Carolina, to Vincennes Steel Corp., Vincennes, Ind.

600 tons, station, Virginia Electric & Power Co., Norfolk, Va., to Virginia Bridge Co., Roanoke, Va.; Stone & Webster Engineering Corp., Boston, contractor.

550 tons, buildings 74 and 78, General Electric Co., Lynn, Mass., to Ernst Iron Works, Buffalo.

525 tons, north approach, Lincoln tunnel, New York, to American Bridge Co., Pittsburgh; George J. Atwell Foundation Corp., contractor.

400 tons, addition to building 122, Frankford arsenal, Philadelphia, to Frank M. Weaver, Philadelphia.

400 tons, additional, power plant extension, Boston Edison Co., Everett, Mass., to American Bridge Co., Pittsburgh.

328 tons, bridge, Pinto Pass, Ala., to Vincennes Steel Corp., Vincennes, Ind.

300 tons, Ocoee No. 3 power house, Ducktown, Tenn., for TVA, to Vincennes Steel Corp., Vincennes, Ind.

280 tons, compressor building, navy yard, Brooklyn, N. Y., to Dreier Structural Steel Co. Inc., New York.

280 tons, torpedo storage house, Hawthorne, Nev., for navy, to Columbia Steel Co., San Francisco; William P. Neil Co., contractor.

215 tons, fuze shop, Frankford arsenal, Philadelphia, to Bethlehem Fabricators, Bethlehem, Pa.

200 tons or more, various defense projects Puget Sound area, to Isaacson Iron Works, Seattle.

200 tons, Puget Sound defense projects, to unstated eastern fabricator; The Austin Co., Seattle, contractor.

200 tons, extension to building 18, navy yard, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa., through Barclay White Co.

165 tons, mezzanine, assembly building, Farmingdale, L. I., N. Y., to Grand Iron Works, New York.

165 tons, approaches, Thames river bridge, Groton, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through A. I. Savin Construction Co., Hartford, Conn.

125 tons, structure additions, Public Service Corp., Bayway, N. J., to Savary & Glaeser Co., Dunnellen, N. J.

100 tons, two bridges, route 28, sections 25 and 26, North Branch, Somerset county, New Jersey, to Bethlehem Steel Co., Bethlehem, Pa.; Ell-Dorer Contracting Co., Irvington, N. J., contractor, A-2 preference rating, bids Dec. 29.

SHAPE CONTRACTS PENDING

3300 tons, shipfitting bay and other structures, Puget Sound navy yard; bids Jan. 21.

2500 tons, Defense Plant Corp. aluminum plant, Tacoma, Wash.; bids Jan. 12.

800 tons, bridge, Westfield river, Springfield, Mass.

700 tons, addition for Adirondack Foundries & Steel Inc., Watervliet N.Y.

500 tons additional wing, Christ hospital, Jersey City, N. J.

500 tons, hangar, Westward Project, Alaska; bids in to United States engineer, Seattle.

400 tons, buildings, Basic Magnesium

Corp., Las Vegas, Nev.; bids Dec. 18.

200 tons or more, bus structure, Coulee power plant; Charles E. Schuler Engineering Co., Newark, O., low to Denver at $24,495.

Unstated tonnage, powder plant, Hercules Powder Co., Merrimac, Wis.; Mason & Hanger Co., New York, engineers.

Unstated tonnage, navy torpedo plant, Amertop Corp., Forest Park, Ill.; R. C. Wieboldt Co., Chicago, contractor.

Reinforcing Bars

Reinforcing Bar Prices, Page 97

Little activity is current in reinforcing steel. While numerous projects are pending, awards are being made slowly, in some cases because priorities have not been obtained. With private construction almost completely throttled suppliers are interested solely in rated tonnage.

Demand for heavier steel mesh for highway construction and engineering work has slackened, but lighter gages entering into camp and government construction continue active with deliveries from five to six weeks. Close to 650 tons for New York state projects, bid last month, are held up while highway programs for other eastern states, dependent on gasoline taxes for part of road and bridge improvements, are uncertain, revenue likely to be restricted by curtailed use of motor vehicles.

Samuel R. Rossoff Ltd., New York, is apparently low on the general contract for construction of the new Gatun locks at the Panama Canal, a project which will take approximately 100,000 tons of steel, including 50,000 tons of reinforcing bars, the remainder being plates, steel castings and special steels. Bids close March 3. Miter gates will also take steel tonnage running into the thousands.

REINFORCING STEEL AWARDS

5000 tons, fuel oil storage facilities, Melville, R. I., to Jos. T. Ryerson & Son and Truscon Steel Co., through Leonard Construction Co., New York.

1800 tons, housing project, Alexandria, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Starrett Bros. & Eken, New York contractors.

1500 tons, Spokane street state viaduct, Seattle, to Bethlehem Steel Co., Seattle; McRae Bros., Seattle, contractor.

700 tons, bulkhead, Tietjen & Land Dry Dock Co., Hoboken, N. J.

500 tons, turbine testing laboratory, navy yard, Philadelphia; bids Jan. 22.

560 tons, factory for Hygrade Sylvania Co. in eastern Pennsylvania; bids Jan. 19.

410 tons, Beach Thorofare bridge and approaches, route 56 (Absecon boulevard) section 1, Atlantic City, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; Ole Hansen, Ventnor City, N. J., contractor, bids Dec. 12, Trenton.

310 tons, bars and mesh, state highway project, Route 28, section 22A, Hunterton county, New Jersey, to Igoe Bros., Newark, N. J., through Jannarone Contracting Co., Belleville, N. J.

305 tons, state highway project, Route 28, sections 25B and 26A, Somerset county, New Jersey, to Truscon Steel Co., Youngstown, O., through Francis A. Canuso & Son, Philadelphia.

273 tons, two bridges, Route 28, sections 25 and 26, North Branch, Somerset county, N. J., to Igoe Bros., Newark, N. J., through Ell-Dorer Contracting Co., Irvington, N. J.

200 tons, Puget Sound defense projects, to Bethlehem Steel Co., Seattle.

200 tons, addition, Crucible Steel Co. of America, Harrison, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

185 tons, state procurement office, Omaha, Neb., Inv., 81-2362, to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.

166 tons, state bridge over Salt Creek, Proj. SN-FA-26-A, Lincoln, Ill., to Laclede Steel Co., St. Louis; Sangamo Construction Co., Springfield, Ill., contractor; bids Nov. 18.

110 tons, state highway project, Maxim Road bridge over Hartford by-pass and approaches, Connecticut, to Bethlehem Steel Co., Bethlehem, Pa.; D. V. Frione & Co., New Haven, contractor.

100 tons, addition, electrical shop, navy yard, Charleston, S. C., to Ceco Steel

CONCRETE BARS COMPARED

	Tons
Week ended Jan. 17	12,259
Week ended Jan. 10	9,698
Period ended Dec. 31	1,121
This week, 1941	9,054
Weekly average, 1942	10,978
Weekly average, 1941	13,609
Weekly average, Dec., 1941	7,362
Total, 1941	26,454
Total, 1942	21,957

Includes awards of 100 tons or more.

Highspeed SHELL TURNING with *cemented carbide tools* and scores of other tough metal-working operations function better with this genuine new development.

Stuart's Solvol Liquid Cutting Compound, unique in the field of tool lubricants, is already in wide use at many of America's largest and best known munitions plants. It is solving cutting problems and definitely doing its part in speeding up production. Try it quickly and benefit by the obvious improvement and economy.

Photos Courtesy of International Harvester Company

Wire for production sample—free to any concern working on defense.

For All Cutting Fluid Problems

D. A. STUART OIL CO.

Chicago, U.S.A. • LIMITED • Est. 1865

Warehouses in All Principal Metal Working Centers

Products Corp., Birmingham; A. K. Adams & Co., Atlanta, Ga., contractor.

REINFORCING STEEL PENDING

10,000 tons, army ammunition dump near Chambersburg, Pa.

126 tons, bridges No. 19 and 20, War Dept. road network, Washington; bids Jan. 27, Federal Works Agency, Washington.

Unstated, materials for Coulee project; bids in at Denver, Jan. 9.

Unstated, improvements Puget Sound navy yard; bids Jan. 21.

Unstated, improvements at Keyport, Wash., torpedo station; Wick & Dahlgren, Seattle, low at $219,471.

Unstated tonnage, powder plant, Hercules Powder Co., Merrimac, Wis.; Mason & Hanger Co., New York, named engineer.

Unstated tonnage, tank parts plant, American Steel Foundries, East Chicago, Ind.; Thorgersen & Ericksen Co., named contractor.

Unstated tonnage, navy torpedo plant, Amerterp Corp., Forest Park, Ill.; R. C. Wieboldt Co., Chicago, named contractor.

Pig Iron

Pig Iron Prices, Page 98

Shipping schedules for pig iron in February are about equal to January volume. Many large iron consumers have not filed requisitions for February deliveries, still drawing on inventory for current melt. This steady drain on reserves is expected to intensify demand later in the quarter as inventory in most cases has been drawn down to a low point and requirements must be met largely from monthly allocations.

Numerous requests for suspension of coke shipments to gray iron foundries indicates decline in production. This is in contrast to the position of steel foundries, which are heavily engaged in war work, particularly for the Navy. Iron foundries believe some of this work could be specified for semisteel, which they could produce, thus relieving the steel foundry burden and hastening deliveries of needed material. This trend indicates probable reduction in demand for foundry pig iron in succeeding months.

Foundries normally engaged on non-war production are getting more war orders, though the process is slow as business is booked by machinery manufacturers and castings orders then passed on to foundries.

"Dislocated" pig iron, that shipped out of a producer's normal trade area, has been distributed by OPM. The price to be paid is on the basis of the basing point nearest the producer, plus freight, minus, $1 per ton. Specific authority to charge more than usual prices must be obtained from OPA.

Cancellation of an order for 8000 tons of cast iron pipe for the Philippines by an eastern pipemaker will release that much pig iron for domestic users.

The New England blast furnace is striving to build up a balanced supply in view of probable necessity for relining within the next few months. This furnace is operating almost entirely on iron ore as supply of borings and turnings is light.

Scrap

Scrap Prices, Page 100

Only occasionally in isolated instances is the shortage of steelmaking scrap relieved and then only temporarily. The situation is most grave and high production of steel is possible only by utilizing every means to bring out additional material and use of a

When charging high scrap mixtures in basic open hearth practice . . . stop expensive foamy reactions, hot roofs, and soft heats . . . use No. 34-30 Mexican Graphite under the lime to give efficient, dependable carbon recovery . . . provides a good working period and helps clean up the hearth quickly . . . contains no sulphur or harmful impurities . . . avoid carbon delays and make steel more quickly with a modern recarburizer highly efficient . . . full particulars and prices quoted upon request.

THE UNITED STATES GRAPHITE CO.
SAGINAW MICH.

NO. 34-30 MEXICAN GRAPHITE

Tool Steel Scrap

Cents per pound, to consumers f.o.b. shipping point

Tungsten Types

For each 1% tungsten contained
Solid scrap containing over 12% . . . 1.80c
Solid scrap containing 5 to 12% 1.60
Turnings, millings containing over 12% 1.40
Turnings, millings, solids under 5% . 1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium 12.50
Turnings, millings, same basis . . . 10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 0.50 vanadium 13.50
Turnings, millings, same basis 11.50

larger proportion of pig iron in open hearths.

While some increase has been noted in tonnage of cheaper grades of steelmaking scrap it has not been sufficient to change the situation materially. Current steel production is on a hand-to-mouth basis in many cases, even of the larger producers. Daily receipts are relied on generally to continue activity. Almost every steelmaking area has open hearths in condition for use which are idle for lack of scrap. Until additional blast furnace capacity or more scrap is available present production is not likely to be exceeded. A conservative estimate is that more than 30 open hearths are idle but in condition for production.

Weather conditions over most of the industrial area have limited collection activities and at least temporarily reduced tonnage of other than industrial scrap.

Automobile gravevards, which are not under control of the scrap industry, are much in the limelight and means are being sought to force owners to dispose of melting scrap. It has been estimated that 1,000 000 tons could be obtained in this way during 1942 without interfering with sale of replacement parts, an important feature of the wrecking business.

Announcement is expected of a projected survey of scrap yards by OPM to determine if dealers are moving scrap into consumption as rapidly as possible.

Oddities in the campaign for gathering in small lots include the announcement by a St. Louis retail grocer that scrap delivered at its stores will be paid for in groceries, the collection to be sold to dealers at once.

Atlantic avenue elevated railroad structure at Boston has been ordered wrecked and it is estimated this will yield more than 10,000 tons of scrap.

Confusion continues as to prices of some grades and sales have been made subject to later official rulings. Among grades on which the situation is not clear are shafting, chemical borings and cotton ties.

A large proportion of industrial scrap moves to consumers by direct negotiation and does not appear in the market.

Warehouse

Warehouse Prices, Page 99

Continued heavy pressure for steel for war purposes is reflected in growing difficulty warehouses have in obtaining shipments against A-9 rating. Until recently they have fared fairly well but with much more tonnage being diverted into higher priority channels it appears the A-9 rating will not be effective.

Demand on warehouses for steel for war purposes is increasing while incoming tonnage is decreasing. Jobbers as far as carbon grades are concerned, have no choice in selection of bookings as long as tonnage carries a rating, even in the B bracket. If they have the steel in stock they are compelled to accept the order regardless of the importance of the rating. Thus they are not able to build up a large percentage of orders bearing ratings above A-9 and in this way expedite replacements.

The situation is tighter in some lines than others, plates, bars, shapes and in less degree sheets, are the major items difficult to get. Shipments of pipe, wire and some other merchant products are coming through fairly well.

In general jobbers regard prospects for obtaining replacements as less encouraging under present regulations. As a result of shrinking warehouse stocks more small lots, usually handled by jobbers, are being directed to mills which do not care to handle such small orders, but feel compelled to accept them because of the high ratings.

Some trade interests expect an easier situation in bars and sheets as a result of suspension of automobile production but at present pressure on these products is heavy.

Navy Seeks Copper Alloy

Closing Jan. 27 under schedule 131 Bureau of Supplies and Accounts, Navy Department, Wash-

10 HOURS SAVED!

Turning

This Long Forged Shaft With KENNAMETAL Tools

Previously this 45 ft. long rough forged steel shaft was turned to 7 1 2" diameter with high speed steel tools in two cuts and with frequent "down time" for regrinding tools. By using two sharp KENNAMETAL tools on this job, roughing and finishing were combined in one cut, the speed was increased to 210 ft. min., and only one regrind per tool per shaft was required. As a result, KENNAMETAL reduced machining time from 13 hours to 3 hours; that is, completed the job in less than 1 4 the previous time.

RECORD SALES PERMIT PRICE REDUCTION

You need pay no more to use the best—KENNAMETAL costs no more than other carbides. Write for new Price List No. 7, effective Jan. 5, 1942. Do you have our Catalog No. 42?

The Largest Manufacturer of Steel-Cutting Carbide Tools

McKENNA METALS Co.
200 LLOYD AVE., LATROBE, PA.
Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York (Exclusive of Canada and Great Britain)

KENNAMETAL
The Accepted
STEEL CUTTING
CARBIDE

ington, is inquiring for 7,546,250 pounds of nickel-copper alloy and nickel - copper - aluminum alloy for delivery to various eastern and western navy yards.

Pacific Coast

Seattle—OPA officials are attempting to adjust the scrap situation, which is becoming more acute. Changed specifications raising No. 2 to the price level of No. 1, $14.50 gross ton, delivered, mill, have failed to attract larger tonnage, although inclement weather has handicapped operations in the field. Dealers complain that the electric steel price of $2 more than heavy mill scrap, does not leave sufficient margin to cover cost of preparation. Cast iron scrap is increasingly scarce and foundries have insufficient supplies. All territory east of Idaho is shipping to Duluth and other eastern centers, removing Montana as a source of supply for Pacific Coast mills.

Paul J. Raver, administrator of Bonneville Power Administration, has allocated $1,815,810 to the Chehalis and J. D. Ross substations, $28,540 for the former and $1,535,270 for the latter, for terminal facilities, transformer bank, additional steel structures and equipment. For the 33-mile 115,000-volt, Potlatch-Bremerton transmission line he has allocated $450,000, this improvement to tie in with Tacoma's municipal system.

Oregon, Washington and Idaho highway departments announce no major improvements in the 1942 program except such roads as are necessary for military operations. Consumption of steel for road work in the three states will be kept at a minimum.

Rolling mills are struggling under heavy backlogs, operating at capacity and seeking no new business. Several large contractors on defense projects are placing additional orders for reinforcing bars under blanket contracts. Demands for construction in Alaska are particularly active.

Inquiry for cast iron pipe is low, due to priorities and uncertain delivery. Small lots are moving out of stocks, which are unusually low and poorly assorted.

San Francisco — Demand for steel continues to hold up well but few large awards are being made. The most serious situation is in scrap and curtailment in production is expected to result soon. Flow of scrap has increased somewhat over the past few weeks but not sufficiently to match consumption and a crisis seems inevitable.

Tin Plate

Tin Plate Prices, Page 96

Nonintegrated tin plate producers expect some curtailment of operations will be necessary in the near future, either from lack of tin or steel, or both. Tightness in tin bars is already causing some production difficulties, as is the tight situation in coiled hot strip.

Independent producers have a certain percentage of tin plate business for army, navy and lend-lease accounts, but most business is not so ticketed because it arises from supply contracts made with canners or canmakers. Some of this material eventually may be shipped to military consumers, but under present conditions it carries no rating and thus cannot be called defense work. This makes it difficult for the tin mill to get satisfactory steel deliveries, since both semifinished mills and strip mills are loaded with tonnage carrying high ratings.

Tin supplies are dwindling and it is more difficult to keep sufficient pig tin stocks. Furthermore, lighter coatings present a problem for the smaller operators in that they are unable to finance electrolytic installations and must rely on mechanical methods and their present equipment, which is bound to increase costs and rejects.

Container manufacturers are being advised of a curtailment in tin plate for use in canning beer and dog food. It is also indicated that there will be at least a partial restriction in the amount available for such food stuffs as coffee, spaghetti, peanuts and other nuts. Sauerkraut, fancy cookies and certain other items may be subject at least tentatively to the same restriction.

Effective at the beginning of January tin was limited to 50 per cent of consumption in the first period of 1940 for the current quarter in various lines, such as novelties, toys, etc. No action was taken at the time with respect to containers and cans, but as indicated above a program is under way to limit consumption in these lines. The over-all pattern appears to be one of allocating tin plate by use rather than by priority certificates. It is the plan to ban the use of tin plate in a number of lines entirely after April 1.

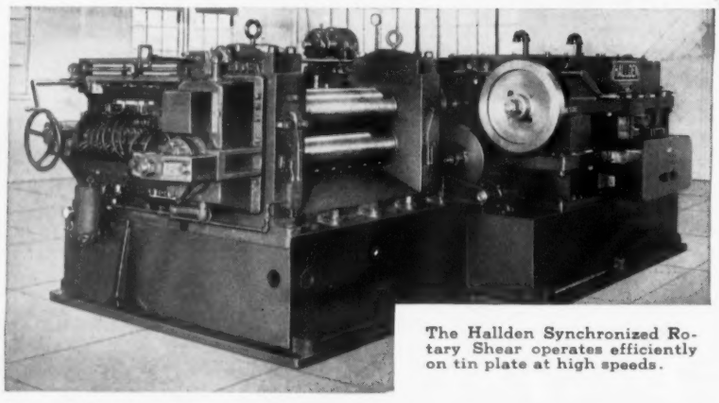
Canada

Toronto, Ont.—To meet rapidly increasing demand for steel on war account, substantial additions are being made to Canadian mills in new open hearth installations and large additions to rolling departments. Owing to difficulty in obtaining scrap additional blast furnace capacity is planned. Announcement is made that Dominion Steel & Coal Corp., Sydney, N. S., will build a new blast furnace and a similar undertaking is planned by Algoma Steel Corp., at Sault Ste. Marie, Ont. It is believed the two stacks will be ready for production within six or eight months, and will aid in providing steel for the large additions to rolling mill capacity.

Further expansion in the shipbuilding program was announced with the placing of orders for 15 minesweepers with Toronto Shipbuilding Co., to cost $13,000,000. Arrangements are underway for purchase of steel for these ships and it is understood that most will be obtained in the United States. Other shipbuilding operations are absorbing most of Canada's present plate output.

Restrictions on production of civilian goods since the first of the year has been reflected in lessened inquiries for sheets, but demand continues to absorb all production and orders continue heavy from war industries. Mill representatives state that sheet backlogs cover production schedules for months.

Merchant bar sales are gaining and while some consumers now are permitted to deal directly with mills practically all new orders are



The Hallden Synchronized Rotary Shear operates efficiently on tin plate at high speeds.

SHEAR SPECIALISTS

The Hallden Machine Company manufactures shears exclusively for any application in steel and nonferrous metals.

THE HALLDEN MACHINE CO. THOMASTON CONN.

Associated Companies: The Wean Engineering Company, Inc.—Warren, Ohio
W. H. A. Robertson & Company, Ltd.—Bedford, England

for war production. Most used bar stocks have been cleaned out by small consumers, unable to obtain deliveries from mills or warehouses.

Pig iron production is at practical capacity, although about 6 per cent under rated capacity. Merchant sales show little change, due to lack of iron rather than demand. Foundry interests are seeking larger tonnages to offset shortage of scrap but meet little success.

Slackening in deliveries of scrap is due to heavy snow. Local producers, however, are maintaining steady flow of steel grades, and dealers are making normal deliveries to mills and electric furnaces. Cast scrap and stove plate are scarce and barely sufficient is available to meet pressing demands and it is only by careful allocation that many foundries are able to continue operation.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 97

Bolt and nut production is at virtual capacity, although manufacturers find it difficult to obtain steel and as a result restrict bookings largely to orders with high ratings. At present they can not do much better than eight weeks on A-1-a ratings and 10 to 12 weeks on A-1-b. On ratings down to A-1-e about 14 weeks is usual, with occasionally somewhat better.

Easing in the bar situation is expected as a result of automobile curtailment, which already is affecting standing bar contracts with automobile manufacturers and affiliated producers. Before adjustments are made and the expanded rearmament program takes hold deliveries may be easier.

Virtual suspension of automobile production for civilian use has not had sweeping effect on bolt and nut order books generally.

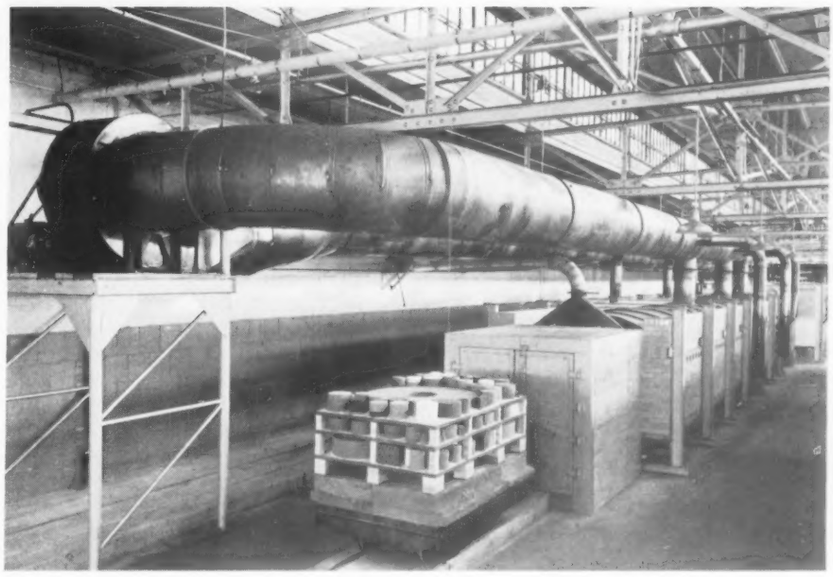
Change on Steel Drums

Price schedule covering used steel drums or steel barrels has been modified by OPA to assure an adequate operating margin for dealers and peddlers. It has established a ceiling of $1.25 each for raw used steel barrels or drums of 50 to 55 gallons capacity, 18-gage, when sold by the emptier to any person. This compares with the former provision imposing such ceiling only when drums were sold direct to users, thus formerly leaving sales by emptiers to other than users free of any restrictions. The resulting bidding up of prices left insufficient margin, OPA claims, to dealers, who were allowed only $1.60 on resale.

Steel in Europe

Foreign Steel Prices, Page 99

London—(*By Cable*)—Steel and iron works in Great Britain are increasingly active and further increase of output is expected. Recent arrivals of foreign iron ore have been at an increasing rate, adding to steelmaking reserves. Plate mills and alloy steel manufacturers are fully occupied and have order backlogs for several months. Demand for galvanized and other grades of sheets is irregular and output is earmarked by the government. Tin plate demand is strong but the supply of tin is uncertain since the Japanese invasion of the Far East.



■ Completion of a building housing this new continuous kiln has enabled the Macklin Co., Jackson, Mich., to increase its vitrified grinding wheel production by 30 per cent

Semifinished Steel

Semifinished Prices, Page 97

Finishing capacity is not being utilized fully in the case of some steelmakers, due to lack of semifinished steel. Non-integrated mills find difficulty obtaining their full needs and some integrated producers have been ordered to ship semifinished steel to lend-lease destinations as well as to other steelmakers having insufficient supply. The result is that production of finished steel is hampered in various instances. Pressure for plates has diverted steel from other departments, notably sheets and wire, production of which has been curtailed considerably.

Some non-integrated sheet mills are operating below 75 per cent of capacity, with order backlogs dictating full production. Some

Superior
steel corporation
HOT & COLD ROLLED STRIP STEEL
AND SUPERIOR STAINLESS STEELS
Successfully Serving Steel Consumers for almost Half a Century
EXECUTIVE OFFICES: GRANT BLDG., PITTSBURGH, PA.
GENERAL OFFICES AND WORKS: CARNEGIE, PA.

pipe mills have difficulty obtaining skelp and rated orders are being delayed.

Nonintegrated producers look to additional allocation orders, similar to the forthcoming order on hot-rolled bars for cold-finished steel production as the only solution. They feel the drain on semi-finished steel from the finishing departments of integrated mills is so heavy that only through an allocation system will nonintegrated producers be able to get an even footing. However, integrated producers report that many of their own mills are not operating at capacity due to lack of material, and that in some cases nonintegrated mills are actually able to operate at a better rate than their own units.

Alan Wood Buys New Jersey Iron Ore Mines

■ Alan Wood Steel Co., Conshohocken, Pa., has bought the Scrub Oak mine, near Wharton, N. J., New Jersey's largest iron mines, and the Oxford, N. J., mining property, from the Warren Foundry & Pipe Co., Phillipsburg, N. J., for about $1,250,000. Alan Wood has been operating these mines under lease since Nov. 1, 1929.

For the past two years the Scrub Oak property has been producing about 325,000 tons of concentrates annually. Production at Oxford has been reduced recently because of further development work at the Washington mine necessitated by diminution of the ore body cross section. In 1940 this mine produced about 157,000 tons of concentrates. This property includes the McKinley ore body, on which development was started some time ago, and other veins.

Acquisition of these holdings, according to John T. Whiting, Alan Wood president, places the company second only to Bethlehem Steel Co. among completely integrated steel and iron companies in the East coast area.

Operations at Scrub Oak were started in 1856 and at Oxford in 1741. About 500 men are employed at the former and 130 at the latter.

Iron mining in New Jersey started in 1710 and about 31,000,000 tons of ore have been shipped. Production expanded until 1880 when opening of the Lake Superior deposits caused it to decline, low point being from 1931-35 when only 555,073 tons was shipped. Since war started in Europe production has increased and in 1940, the last year for which figures are available, about 1,300,000 tons was mined. Estimates place New Jersey iron ore reserves at 600,000,000 tons of magnetite with iron content of 40 to 60 per cent. Beneficiation yields concentrates of about 67 per cent iron.

Iron Ore

Iron Ore Prices, Page 99

Baltimore—Ore arrivals here were somewhat lighter in December. Iron ore importations totaled 157,180 tons, against 185,530 tons in November; manganese ore, 94,150, against 143,661; and chrome ore, 35,765, against 58,349. Last month's arrivals also compared with 157,900 tons of iron ore, 91,771 tons of manganese and 44,158 tons of chrome ore in December, 1940.

Arrivals so far this month include 22,000 tons of iron ore from Cruz Grande and 5700 tons from Daiquiri; 10,300 tons of chrome ore, from Lourence Marques; and 4000 tons of manganese ore from Vizagapatam, 3000 tons from Calcutta, and 3700 tons from Santiago.

Manganese ore arrivals in December included cargoes from Calcutta, Rio de Janiero, Santiago, Bombay, Durban and Vizagapatam. Chrome ore cargoes were received from Lourenco Marques, Masinloc, Neuvitas and Beira.

Iron Ore Production At New High in 1941

Iron ore production in the United States in 1941 was the largest on record, surpassing the previous record year, 1917, by 23 per cent, according to estimated figures by the Bureau of Mines.

Total for the year is estimated at 92,499,000 gross tons, an increase of 25 per cent over production in 1940. Ore shipped from mines in 1941 totaled 92,684,000 tons, valued at $230,593,000, an increase of 23 per cent in quantity and 22 per cent in total value, compared with 1940. Stocks at the mines at the end of 1941, mainly in Michigan and Minnesota, were 3,451,000 tons, a decrease of 5 per cent from the previous year.

Lake Superior mines contributed about 86 per cent of the ore shipped in 1941, production being 79,130,000 tons and shipments 79,315,000 tons, increases of 29 and 26 per cent, respectively, compared with 1940. These totals include shipments by rail as well as by water but exclude manganiferous ores amounting to approximately 1,185,000 tons in 1941 and 1,064,991 tons in 1940 that contained 5 per cent or more manganese in the natural state. Stocks at Lake Superior at the close of 1941 were 3,325,000 tons, 4 per cent less than a year earlier.

Output in the southeastern states, in which the Birmingham, Ala., district is the largest producer, approximated 7,951,000 tons, an increase of 7 per cent. In the northeastern states, including the Adirondack area and the Cornwall district, 3,975,000 tons were mined, an increase of 12 per cent over 1940.

Senate Votes To Permit Canadian Ships in Ore Trade

Senate last week passed a bill to permit vessels of Canadian registry to transport iron ore between United States ports on the Great Lakes during the 1942 season. Similar action was taken during the 1941 season.

Metallurgical Coke

Coke Prices, Page 97

Several coke sellers are preparing appeals from the $6 top price requested by OPA on beehive furnace coke. Meanwhile most coke is being sold at $6, with a few

Lee Conveyor SCREWS
are helically coiled bands of metal pitched to requirements, for welding to a shaft. Light in weight; great in strength, toughness and adaptability, they make a preferred method of constructing helical conveyor screws. Promptly available in low carbon steel for all ordinary applications or in 16-18% chrome steel for resistance to corrosion and abrasion. Other metals also available. You are invited to look into the possibilities of this preferred conveyor screw.
Write for Folder
Lee SPRING CO., INC.
30 MAIN STREET BROOKLYN N. Y.

scattered spot sales at higher prices.

Absence of ceiling on foundry coke has had little effect. Current foundry buying, most of it on preference rating, indicates a wider spread of defense contracts and subcontracts.

Change in the beehive situation is expected later in the year when new blast furnaces and additional by-product ovens come into production. Completion of by-product ovens will ease demand on beehive production for the new stacks although the overall situation may continue demand for that type of fuel.

Coal Tar Pitch "Best To Stop Magnesium Fire"

New and effective methods of extinguishing magnesium fires in commercial plants have been developed by the Bureau of Mines. Designed for places where magnesium is handled continuously the method is equally effective on incendiary air bombs in wartime. Hard coal-tar pitch in granulated or flaked form is highly satisfactory, the pitch forming an air-tight blanket, smothering the flame. This method is considered superior to use of sand or water or prepared compounds, such as carbon tetrachloride, carbon dioxide or foam.

Increased use of magnesium metal for aircraft and other military purposes, often resulting in explosions and fires led to research for best methods of control.

Nonferrous Metals

New York—Government agencies made several revisions in metal price arrangements last week in an effort to stimulate production in all quarters. Metals Reserve Co. has agreed to pay prices above the present ceilings for copper, lead and zinc production in excess of the 1941 output. Purchase agreements will be made for a period of at least 2½ years. Ceiling prices were established on primary lead, secondary lead and lead scrap.

Copper—MRC will pay 17.00c a pound for copper produced in excess of quotas to be fixed by OPM and OPA. Refiners are now preparing a program to be submitted to the government for operation of facilities at capacity, partly on copper bearing scrap. Effective Feb. 1, premiums on less than carload lot shipments of copper from refineries will be reduced. Changes include: ¼-cent reduction in premium of producer of castings copper; a change in the ceiling price on less than carload lots on other than castings copper to 12.12½c a pound at refinery. OPM is expected to present soon a plan for subsidizing marginal copper production, including marginal properties of larger producers.

Lead—OPA established a ceiling price of 6.50c, New York, and 6.35c, St. Louis. Ceiling prices were also established on lead scrap and secondary lead, based on the new maximum level for primary metal, but lead product producers were requested not to advance prices above the Jan. 2 price levels. MRC has agreed to pay up to 9.25c for production in excess of quotas based on 1941 output.

Zinc—MRC's offer to buy zinc at prices up to 11.00c on production in excess of quotas based on 1941 output is a further step to increase ore production to match the steady increase in zinc smelting capacity, which had been the chief bottleneck.

Tin—Capacity of the smelter being built at Texas City, Tex., has been increased to 30,000 tons annually. Importers are now preparing a plan for the distribution through normal trade channels of tin on hand and to be acquired by the government.

Nonferrous Metal Prices

	Copper			Straits Tin, New York		Lead	Lead	Zinc	Aluminum	Antimony	Nickel
Jan.	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	N. Y.	East St. L.	St. L.	99%	Amer. Spot, N.Y.	Cathodes
1-12	12.00	12.12½	11.75	52.00	52.00	5.85	5.70	8.25	15.00	14.00	35.00
13-16	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.10
Zinc, 100 lb. base	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices

No. 1 Composition Red Brass

New York	10.12½-10.25
Cleveland	10.25-10.50
Chicago	10.25-10.50
St. Louis	10.50

Heavy Copper and Wire

New York, No. 1	10.00
Cleveland, No. 1	10.00
Chicago, No. 1	10.00
St. Louis	10.00

Composition Brass Turnings

New York	9.37½-9.75

Light Copper

New York	8.00
Cleveland	8.00
Chicago	8.00
St. Louis	8.00

Light Brass

Cleveland	6.00
Chicago	6.00-6.25
St. Louis	6.25

Lead

New York	5.95
Cleveland	5.95
Chicago	5.85
St. Louis	5.80

Old Zinc

New York	5.00-5.25
Cleveland	4.00-4.12½
St. Louis	4.50-5.00

Aluminum

Mis., cast	11.00
Borings, No. 12	9.50
Other than No. 12	10.00
Clips, pure	13.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l. c. l.	13.25
Standard No. 12 aluminum	14.50

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ALL TYPES AND SIZES

Horn
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Straight Side
Roll and Dial Feeds
Double Action
Double Crank
Punching
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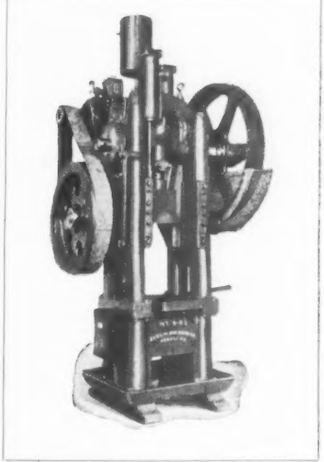

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56 Avenue A. Newark, N. J.

Promotions Made in Potts Co. Executive Staff

■ Guy T. Bible has been named executive general manager of Horace T. Potts Co., iron and steel distributor, Erie avenue and D street, Philadelphia. Arthur L. Collins has been named sales manager; Morris E. Neeley, warehouse manager; and Claude Mengel, office manager and purchasing agent.

Mr. Neeley has been affiliated with the company since 1901; Mr. Bible, 1912; Mr. Mengel, 1920, and Mr. Collins, 1922. Their duties will continue along the same lines as heretofore.

Thomas C., Harrison I., and Horace M. Potts, all sons of Horace T. Potts, and of the fourth generation to be identified with the company, will continue in the firm, although relatively less active than heretofore. Horace T. 2nd, Thomas I., and Edward R. Potts, all of the fifth generation, also are identified with the company.

Long a leading distributor in the district, the company was organized in 1815 by William Lukens Potts, who served an apprenticeship in mechanics under David Rittenhouse, famous astronomer and instrument maker. The company, which conducted what was known in its early days as an "iron store", remained within two blocks of its original address for 108 years, expanding during that time with three additional warehouses. The company moved to its present address, and into still larger quarters, in 1923.

FOR IMMEDIATE SALE

MOTOR GENERATOR SET

For A. C. Spot Welding Machines

Motor—150 H.P. 2300 volts 3-phase 60 cycle plate no. 156P984, and its Exciter.

Generator—700 KVA, single phase voltage from 400 to 600 volts with pilot generator 125 volts D.C., 15 KW and control panel.

In excellent running condition. Manufactured by Westinghouse Electric & Mfg. Co. in 1938. Original cost about $13,000.

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SPECIALTY EQUIPMENT & MACHINERY CO.
230 PARK AVE. NEW YORK, N. Y.

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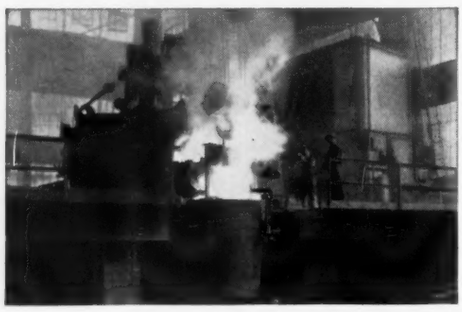
CARBON-ALLOY AND SPECIAL BASIC ELECTRIC STEELS



COMPLETE control of all processing from selection of the melting charge to the finished condition is the N. F. & O. *guarantee of quality* in forgings furnished to your specifications — Smooth Forged, Hollow Bored, Rough or Finish Machined. Die Blocks and Piston Rods

NATIONAL FORGE AND ORDNANCE CO.
IRVINE, WARREN COUNTY, PENNA., U. S. A.

Premiums on lcl Copper Changed in Price Schedule

Changes in premiums on less than carload lot shipments of copper from refineries are provided in an amendment to the copper price schedule (No. 15). Features of the amended schedule include the following:

(1) Reduction of ¼-cent per pound in the premium which may be paid on producer sales of small lots of casting copper.

(2) A change in the ceiling on less than carload lots of copper, other than casting, to a 12⅛-cent per pound price at the refinery, as compared with the previous 12½-cent price, delivered at Connecticut Valley points.

(3) A provision permitting any person to sell copper to the Metals Reserve Co., or any other government department, agency or corporation previously approved in writing by the OPA, at prices higher than the stated maximum prices.

(4) Discontinuation of a previous provision allowing dealers to resell their copper inventory purchased over 12 cents per pound at a base price of 12½ cents. Such dealer stocks are now exhausted.

(5) Reduction of the period for keeping records of sales from five years to one. This is the period provided in other schedules issued by OPA.

Two changes were made in the casting copper field. First, the breakpoint set forth in the original order was changed from a minimum carload of not less than 40,000 pounds, to a 20,000-pound quantity. Second, the premium on sales of less than 20,000 pounds has been reduced to ¼-cent. In the original schedule, a premium of ½-cent per pound was permitted on less than 40,000-pound lots. Schedule is effective Feb. 1.

OPA To Check Scrap Shipments for Upgrading

Plans designed to eliminate the practice in some instances of misgrading scrap steel and iron were issued last week by Price Administrator Henderson in a letter sent to consumers of these products. The OPA's objective is an absolute elimination of such forms of price increases.

The program was set up after ex-

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of those who do the important things in business, social and public life. It may be a business meeting, a small dinner, a great banquet, an exclusive party, or a number of each at the same hour—the Bellevue embraces them all in the tremendous capacity of its facilities—each with an intelligent service that leaves nothing to be desired.

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CLAUDE H. BENNETT, *General Manager*

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The
POWER THAT MAKES YOUR TRUCKS MORE PROFITABLE
★READY-POWER Industrial Truck Power Plants are applicable to practically all electric trucks now battery operated. The change-over can be made in a few hours in your own shop.

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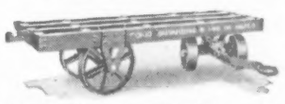

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tensive conversations with leading scrap steel and iron consumers. Mr. Henderson stated that its success depends largely upon the "wholehearted and complete co-operation" of the consumers.

OPA has obtained the services of a staff of inspectors, experienced and competent, to inspect and accurately grade incoming scrap shipments. Consumers are asked to give these inspectors access to their incoming shipments, so that they may inspect the scrap prior to unloading.

Inspectors will make visits to consumer plants from time to time, without set schedules. In this way, they will make spot gradings of materials.

Time Element Rules in War Work, Says Gillies

■ Emphasis on the time element in war preparation was the keynote of an address by Donald B. Gillies, vice president, Republic Steel Corp., before the Cleveland Junior Chamber of Commerce, Jan. 14.

He outlined the difficulties of changing from production of peacetime goods to war necessities, the time element involved in preparation of plants, machinery design and personnel before the first product can be run off the assembly line. Once this stage is passed, said Mr. Gillies, "we are going to turn out planes, guns, tanks and ships and the other materials of war in quantities which no other nation in the world has ever even attempted to approach. We are already doing that with some types of equipment. Our performance will step up, month by month, right through 1942 and by 1943, as Churchill says, we will be ready to take the offensive in this war."

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Construction and Enterprise

New Jersey

EDGEWATER, N. J.—Spencer Kellogg & Sons Inc., River road, has let contract for altering and repairing manufacturing buildings. Estimated cost $40,000.

NEWARK, N. J.—Worthington-Gamon Meter Co., 296 South street, will build one-story, 60 x 70-foot machine shop addition. J. D. King, 695 Ridge street, architect.

NEWARK, N. J.—American Transformer Co., 172 Emmett street, has let contract to Fred J. Brotherton Inc., 200 Main street, Hackensack, N. J., for one-story, 165 x 165-foot factory. Cost $40,000.

NEW BRUNSWICK, N. J.—Mack Mfg. Co., 97 Jersey street, will build one-story steel tank transmission building, and

Additional Construction and Enterprise leads may be found in the list of Shapes Pending on Page 104 and Reinforcing Bars Pending on page 106 in this issue.

has let contract to Willcox Construction Co. and Clemms Construction Co., 2520 Forty-first street, Long Island City, N. Y.

ORANGE, N. J.—Monroe Calculating Machine Co., 555 Mitchell street, has plans by Epple & Kahrs, 17 Washington street, Newark, N. J., for 100 x 200-foot machine manufacturing building. Cost over $40,000.

TRENTON, N. J.—Winner Mfg. Co., 623 Prospect street, has let contract for 80 x 100-foot factory to Karno-Smith Co. Inc., Broad Street Station. Cost $40,000, including equipment. J. H. Harvey, 38 West State street, architect.

New York

DUNKIRK, N. Y.—Alco Products Inc., E. N. Boswell, manager, plans addition to plant to cost over $40,000.

OLEAN, N. Y.—Clark Bros. Co., 600 Lincoln avenue, will erect one-story manufacturing unit, costing approximately $50,000.

Massachusetts

FRAMINGHAM, MASS.—Angier Corp. is having plans drawn by L. Larsen, Statler building, Boston, for steel factory addition, to cost about $40,000.

MANSFIELD, MASS.—S. W. Card Mfg. Co., division Union Twist Drill Co., 70 Munroe street, Athol, Mass., has plans by A. Johnson, 390 Main street, Worcester, Mass., for one-story manufacturing plant addition. Cost over $40,000.

Ohio

BERGHOLZ, O.—Village, S. G. Carson, mayor, Clarence Hackathorn, clerk, is taking new bids due noon, Jan. 28, for waterworks treatment plant. Bids taken Dec. 29 were rejected. Carl Simon & Associates, Evans-Central building, Van Wert, O., are consulting engineers.

CANTON, O.—Diebold Safe & Lock Co., 818 Mulberry road, has awarded general contract to Melbourne Bros. Construction Co., 2101 oWodland avenue, for erection of factory to cost $50,000.

CLEVELAND—Locke Machine Co., 971 East Sixty-third street, Elbert H. Baker Jr., vice president, will build a 1100-square foot addition to its factory.

CLEVELAND—Lake Shore Machine Co., 1340 East 222nd street, Daniel R. O'Connell, president, is expanding production facilities with $16,000 addition to plant.

CLEVELAND—Bomb Shelter Inc. has been incorporated by E. C. Ward, 1564 Euclid avenue, and Miss E. E. McCloud, 5112 Archmere avenue, to market a steel and concrete shelter invented by Jacob Baker, 2032 Olive avenue, Lakewood, O.

CONNEAUT, O.—Burke Machine Tool Co., Sandusky street, is expanding its plant by 4000 square feet. Mr. Rockwell is in charge.

MARION, O.—Marion Steam Shovel Co. has plans for construction of an addition to its foundry, making possible a 30 per cent increase in production.

Pennsylvania

POTTSTOWN, PA.—Jacobs Aircraft Engine Co. is erecting a factory near its plant here, to cost approximately $15,000,000.

Michigan

DETROIT—Donnelly Engineering & Mfg. Co. Inc., 6850 Michigan avenue, has been organized with $50,000 capital to manufacture machinery. Correspondent: James Powers, 7805 Hartwell, Dearborn, Mich.

LANSING, MICH.—Reniger Construction Co., Lansing, has been awarded general contract for superstructure for an addition to the Lansing municipal power plant.

YPSILANTI, MICH.—Couse & Saunders,

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INHIBITORS
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Chemical Engineers To The Steel Industry

Detroit, have been awarded general contract for pumping station at the bomber plant of Ford Motor Co. near here. Hubbell, Roth & Clark Inc., Detroit, engineers.

Illinois

CHICAGO—Overarm Machine Co., 209 South LaSalle street, has been incorporated with 5000 shares of par value at $10 a share by E. P. Essley, G. F. Bryant, and E. L. Essley, to manufacture, construct and deal in machinery, appliances, etc. Correspondent: Cassels, Potter & Bentley, 209 South LaSalle street.

CHICAGO—Lincoln Mfg. Co., 2617 West Fletcher avenue, is expanding its facilities to accommodate increased volume in defense orders by building an addition to provide 5000 square feet of floor space. J. Emil Anderson & Son, 3659 West Belle Plaine avenue, general contractor.

CHICAGO—D. O. James Mfg. Co., 1114 West Monroe street, will increase its production of gears for antiaircraft guns and tanks by 15 per cent through expansion of its facilities. A one-story building is being erected to be used for warehousing and shipping, and space now used for this purpose will be converted to manufacturing uses.

MELROSE PARK, ILL. — American Brake Shoe & Foundry Co. is building a one-story warehouse to cost $20,000, and space now used for warehousing will be made additional machine shop and foundry area.

MONMOUTH, ILL.—Western Stoneware Co. is replacing plant No. 2 at cost of about $100,000, including equipment.

MOLINE, ILL.—Moline Tool Co. has permit for erection of an addition to its plant, 41 x 121 feet, to cost about $31,000.

Alabama

ALBERTVILLE, ALA.—REA has allotted $548,000 to Marshall De Kalb Electric Co-operative, C. M. Elrod, president, to finance 409 miles of rural transmission lines to serve 2885 customers.

BIRMINGHAM—Sloss Sheffield Steel & Iron Co., 3131 First avenue North, plans to recondition, equip and reopen its Bessie mine to produce coal; will install machinery to enable production between 1500 and 2000 tons daily.

GORGAS, ALA.—Alabama Power Co., Birmingham, Ala., will soon call bids for steam power plant.

District of Columbia

WASHINGTON — Bureau of Supplies and Accounts, Navy Department, will take bids until 10 a.m., Jan. 27, schedule 21, 218 conveyors, scooters and trucks, delivery Pearl Harbor, T.H.; schedule 9975, three generator test units, delivery Pearl Harbor, T. H., and Dutch Harbor, Alaska.

North Carolina

SOUTHPORT, N. C.—Allocation of $91,142 for additions and extensions to municipal power plant has been approved.

Tennessee

NASHVILLE, TENN.—Universal Concrete Pipe Co., 295 High street, Columbus, O., care of I. A. Heinzman, district manager, will soon call bids for plant here. Approximate cost $75,000.

Virginia

ARLINGTON, VA.—Arlington county water department, A. T. Lundberg, chief engineer, is having plans prepared by Chester Engineers, 210 East Parkway at Sandusky, Pittsburgh, for waterworks system to cost approximately $587,000.

Arkansas

LITTLE ROCK, ARK.—United States Engineer office, Little Rock, will take bids Jan. 22 for furnishing and installing complete a 350-gallon-per-minute multistage impeller type pump and controls at Nimrod dam near Ola.

Wisconsin

CUDAHY, WIS.—Ladish Drop Forge Co., 5405 South Packard avenue, will soon let contract for one-story, 100 x 425-foot steel storage shed addition and one-story 125 x 300-foot forge shop addition.

Minnesota

VIRGINIA, MINN.—Northern Electric Co-operative, Fritz E. Anderson, superintendent, will take bids soon on 296 miles of transmission lines to serve 939 customers. General Engineering Corp., 2944 Cedar avenue, Minneapolis, consulting engineer.

Texas

BELLAIRE, TEX.—City, care of A. B. Zindler, mayor, has been allotted $55,000 funds for construction of addition to sewage system. Garrett Engineering Co., 3504 Audubon street, Houston, Tex., consulting engineer.

TEXAS CITY, TEX.—M. V. Billeton-Maatschapij is making arrangements to enlarge tin smelter now under construction. Plant will probably be in operation about April 1.

North Dakota

ASHLEY, N. DAK.—City, E. E. Spitzer, auditor, will take bids soon on materials for construction of waterworks plant and sewer system, estimated to cost $40,000. P. M. Barnes, Valley City, N. Dak., engineer.

Nebraska

PLATTSMOUTH, NEBR.—City, Albert Olson, clerk, is considering plans for waterworks plant. Henningson Engineering Co., Standard Oil building, Omaha, Nebr., consulting engineer.

Iowa

AMES, IOWA—City is planning construction of sewage disposal plant to cost about $50,000 with equipment. B. Whittler, city engineer, is in charge of plans.

Montana

CUT BANK, MONT.—City, Alice Rush, clerk, is considering plans for enlargement of sewage disposal plant, estimated to cost about $45,000.

California

LOS ANGELES—Harvey Machine Co. will erect an addition to its plant at 6200 Avalon boulevard.

Washington

BREMERTON, WASH.—Incorporation papers of Magneweld Corp., Bremerton, have been filed by Jones & Bronson, Colman building, Seattle, to specialize in welding machines and supplies.

SEATTLE — American Foundry Co., 2944 First avenue South, recently damaged by fire, has awarded contract to Henrik Vallee to rebuild.

Canada

ST. JOHN, N. B.—Saint John Dry Dock & Shipbuilding Co. Ltd., Bayside drive, will erect addition to plate shop to cost about $40,000. Acme Construction Co. Ltd., 45 Canterbury street, has general contract.

HAMILTON, ONT.—Norton Co. of Canada Ltd., 3 Beach road, will erect plant addition to cost $36,000, including equipment. General contract awarded to James Kemp, 45 Barnsdale avenue. Architects, Prack & Prack, Pigott building.

HAMILTON, ONT.—Otis-Fensom Elevator Co. Ltd., Victoria avenue North, has let general contract to W. H. Yates Construction Co. Ltd., 400 Wellington street North, and preliminary work has been started on a heat treating plant, gun barrel plant and two storage buildings, to cost about $1,000,000, including equipment.

LEASIDE, ONT.—Leeds Steel Products Ltd. plans plant on Laird avenue for manufacture of small tools, etc., estimated to cost about $50,000, with equipment.

NEW TORONTO, ONT.—Wilson Motor Bodies Ltd., 48 Abell street, Toronto, plans plant on Lake Shore road here to cost about $80,000, with equipment.

PORT ARTHUR, ONT.—Port Arthur Shipbuilding Co. Ltd. will spend $150,000 on installation of new hot dip galvanizing plant. C. D. Howe Co. Ltd., Public Utilities building, engineer.

TORONTO, ONT.—New Standard Foundry Co., Jarvis street, plans to rebuild foundry and install equipment. Estimated cost about $25,000.

TORONTO, ONT.—Webber Machine Co., 15 Alcorne avenue, Roy H. Webber, president, plans erection of machine shop. Building and equipment to cost about $50,000.

TORONTO, ONT.—Trane Co. of Canada Ltd., 4 Mowatt avenue, will build plant addition and install equipment to cost about $25,000. R. G. Kirby & Son Ltd., 539 Yonge street, has general contract.

HULL, QUE.—Hull Iron & Steel Foundries Ltd., Montcalm street, will start work early this year on erection of plant addition, building to cost about $350,000 and equipment $600,000, for which general contract has been let to R. Brunet & Fils, 35 Aylmer road, Hull. Plans have been prepared by Richards & Abra, architects, 55 Metcalfe street, Ottawa, Ont.

LATUQUE, QUE.—Brown Corp. Ltd. will erect plant addition for pulp production and install equipment to cost $650,000. Plans are being prepared by R. A. Rankin & Co., 1420 Sherbrooke street West, Montreal.

MONTREAL, QUE.—Canadian Car & Foundry Co. Ltd. will build die-sinking building, 40 x 50 feet, at the Ville St. Pierre works to cost about $60,000.

MONTREAL, QUE.—Imperial Oil Ltd., St. Patrick street, will build plant addition and install new equipment here to cost $52,000. Main office of company is 55 Church street, Toronto, Ont.

MONTREAL, QUE.—Canadian Oil Companies Ltd. will build plant addition at 6010 Notre Dame street East to cost about $25,000, including equipment. F. C. West, Terminal Warehouse, Toronto, is president.

MONTREAL, QUE.—Thompson Electric Works Ltd., 915 St. Genevieve street, has let general contract to Montclair Construction Co., 656 St. Margaret street, for erection of plant addition, to cost about $50,000, including equipment.

MOUNT ROYAL, QUE.—Canadian Marconi Co. Ltd., 2440 Trenton avenue, is considering plans for further addition to plant to cost, with equipment, about $75,000.

STE. THERESE, QUE.—Commonwealth Plywood Co. Ltd. will build plant addition to cost $26,000 to supply plywood and veneers for aircraft industry.

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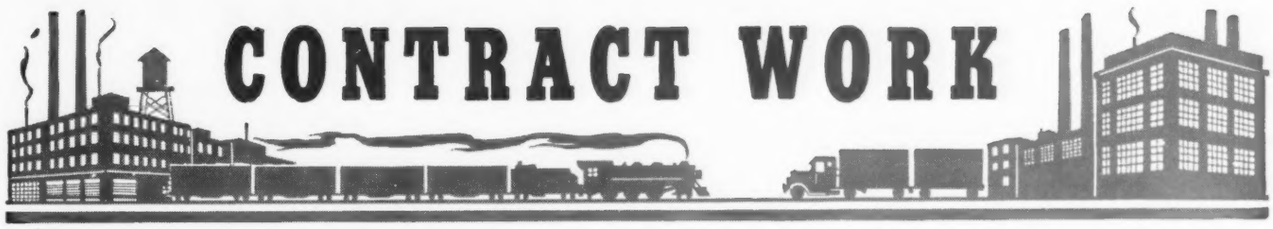

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How the fund is allocated . . . What it does in service

Every dollar that you give now to your Red Cross marches into the thick of things where humanitarian help is needed most—up to the fronts and battle stations where the fighting is heaviest. Into the Red Cross hospitals and First Aid units where prompt medical attention and supplies may save innumerable lives. And throughout our broad land to train and equip volunteers to meet any emergency that may strike.

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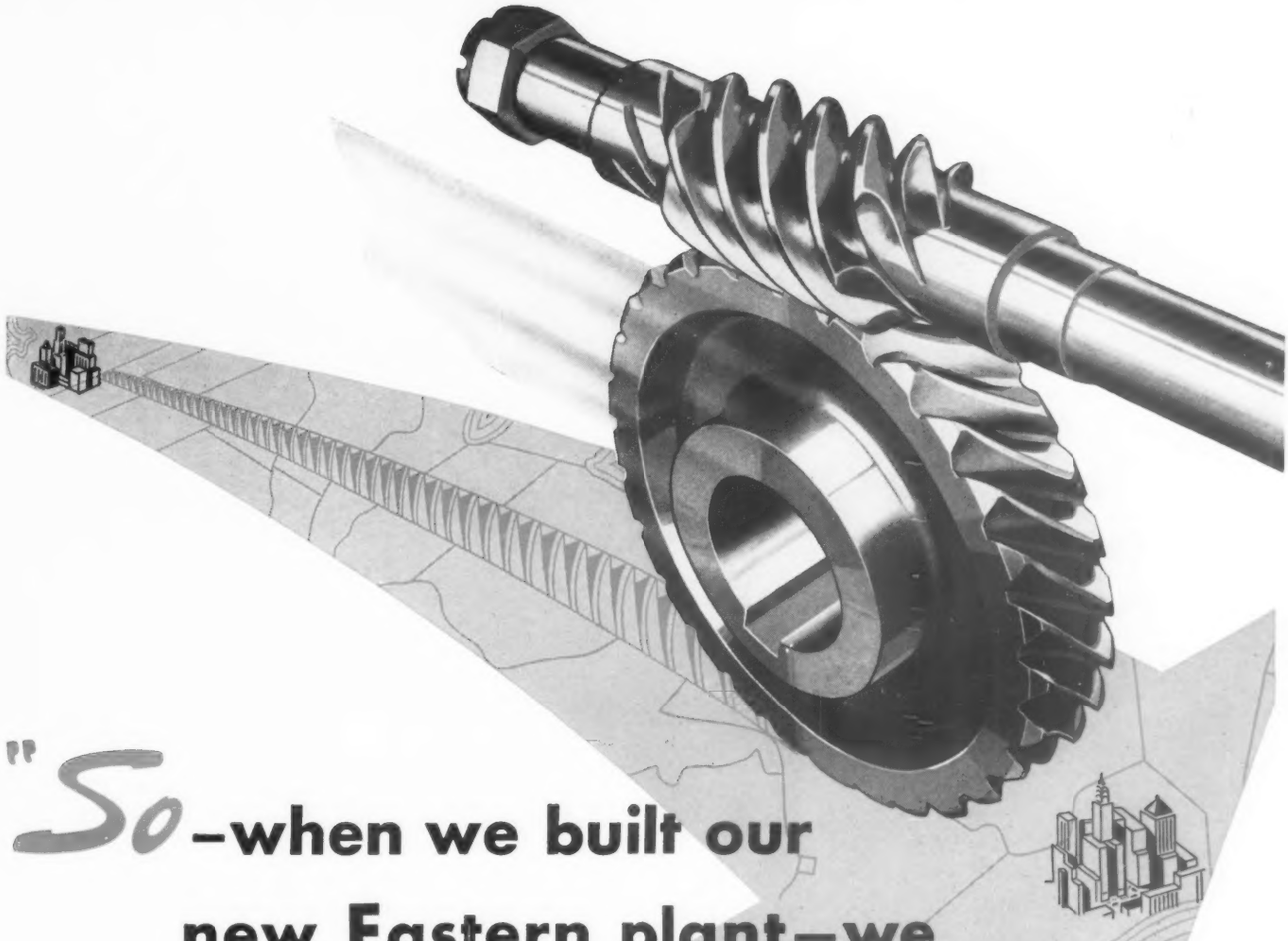

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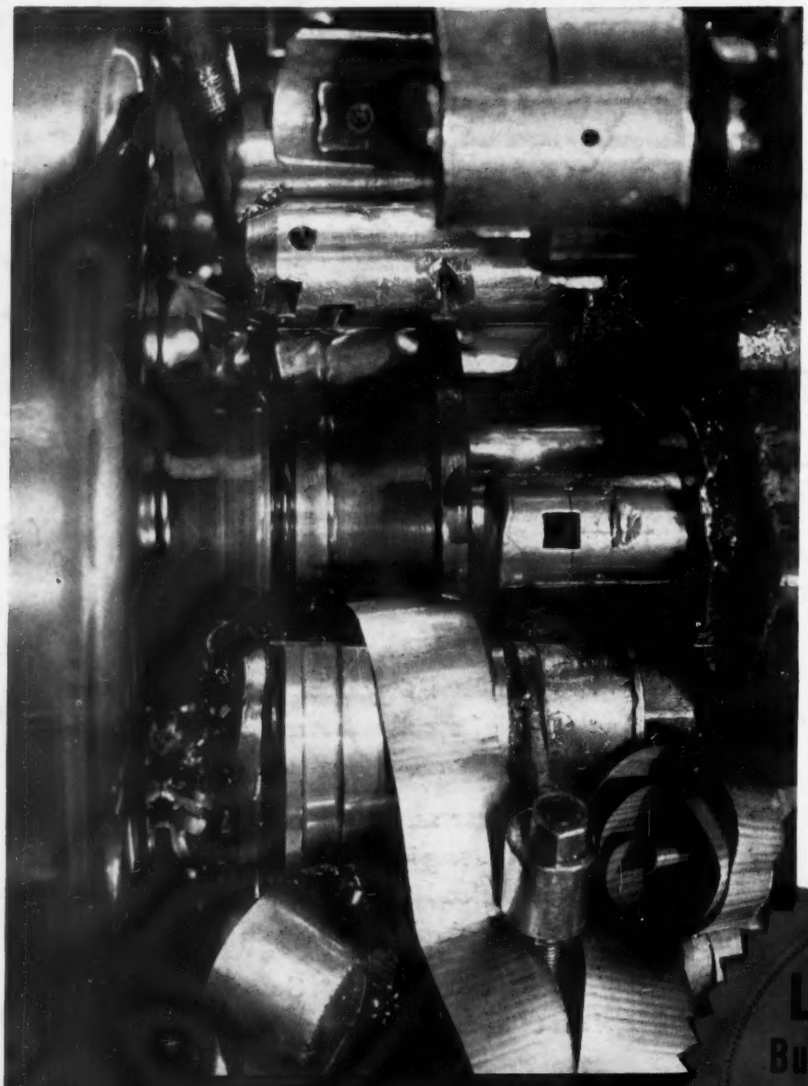
A tip to Machinists

Protect the cutting edges



Protect the cutting edges on your machine tools by using tubing in place of bar stock in the fabrication of cylindrical parts.

The tools are more accessible to the coolant and the cooling action of the air. Lowered temperatures save tool edges, reduce down time and allow longer life.

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Steel and Tube Division

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TRADE-MARK REG. U. S. PAT. OFF.
ALLOY STEELS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

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